



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Drives for medical and rehabilitation devices

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### Course

Field of study

Biomedical engineering

Area of study (specialization)

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

3/5

Profile of study

general academic

Course offered in

polski

Requirements

compulsory

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### Number of hours

Lecture

15

Tutorials

Laboratory classes

Projects/seminars

15

Other (e.g. online)

### Number of credit points

2

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### Lecturers

Responsible for the course/lecturer:

PhD Eng. Wojciech Ptaszynski

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Faculty of Mechanical Engineering

ul. Piotrowo 3, 60-965 Poznań

Responsible for the course/lecturer:

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### Prerequisites

Basic knowledge of machine construction, basics of machine construction, electrical engineering and



automation. The ability to think logically, use information obtained from the library and the Internet. Understanding the need for learning and acquiring new knowledge.

### Course objective

Understanding the construction, elements and principles of selection of drives for medical devices

### Course-related learning outcomes

#### Knowledge

The student should be able to characterize the basic types of medical device drives. The student should know the basic methods of selecting medical device drive components.

#### Skills

Student is able to determine the requirements of drives for a given medical device. The student is able to independently design the medical device drive scheme. The student is able to choose the components of the medical device drive.

#### Social competences

Student is able to cooperate in a group. The student is aware of the possibilities of modern medical device drives. The student is able to use the catalog data of the manufacturers of drive components for medical devices.

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: Credit based on a test consisting of five general questions. Credit in the case of a correct answer to min. 3 questions.

Project: Credit based on the assessment for the implementation of the individual design of the drive selection for the indicated medical device

### Programme content

Lecture:

1. Requirements for drives used in medical devices, especially regarding sterility.
2. Characteristics of drives used in medical devices, pneumatic, electric and electro-mechanical.
3. Medium power drives for driving rehabilitation devices.
4. Low power drives and micro drives.
5. Drives for vibrating and dosing devices.
6. Kinematic drives and robots and operational manipulators.
7. Calculations and selection of drives due to loads.
8. Supply and control of medical device drives.



9. Maintenance and periodic inspections of drives.

Project:

Individual design of medical device driven (e.g. rehabilitation device, medical manipulator, dispensing device)

**Teaching methods**

Lecture illustrated by multimedia presentations

**Bibliography**

Basic

1. Szenajch W. Napęd i sterowanie pneumatyczne. WNT
2. Kamiński G. Silniki elektryczne z toczącymi się wirnikami, PW
3. Materiały dydaktyczne PP dotyczące budowy i rodzaju napędów

Additional

1. Kosmol. J.: Serwonapędy obrabiarek sterowanych numerycznie, WNT Warszawa 2004

**Breakdown of average student's workload**

	Hours	ECTS
Total workload	45	2,0
Classes requiring direct contact with the teacher	30	1,5
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) <sup>1</sup>	15	0,5

<sup>1</sup> delete or add other activities as appropriate