COURSE DESCRIPTION CARD - SYLLABUS

Course name

Hydraulic and pneumatic systems of means of transport

Course

Field of study

Transport

Year/Semester

3/6

Area of study (specialization)

Profile of study

general academic

Level of study

First-cycle studies

Course offered in

Polish

Form of study

full-time

Requirements

compulsory

Number of hours

Lecture

30

Laboratory classes

15

Other (e.g. online)

Tutorials

Projects/seminars

Number of credit points

4

Lecturers

Responsible for the course/lecturer:

dr inż. Damian Frąckowiak

email: damian.frackowiak@put.poznan.pl

tel. 61 665 2054

Wydział Inżynierii Materiałowej

ul. Piotrowo 3, 60-965 Poznań

Responsible for the course/lecturer:

dr inż. Mateusz Kukla

email: mateusz.kukla@put.poznan.pl

tel. 61 224 44 514

Wydział Inżynierii Materiałowej

ul. Piotrowo 3, 60-965 Poznań

Prerequisites

Knowledge: The student has a basic knowledge of the basics of machine construction, fluid mechanics, the basics of automation and electrical engineering

Skills: The student is able to solve simple problems in the field of fluid mechanics and the basics of machine construction

Social competences: The student is able to cooperate in a group, assuming various roles in it.

The student is able to determine the priorities important in solving the tasks set before him.

The student shows independence in solving problems, gaining and improving the acquired knowledge and skills

Course objective

The aim of the course is to learn the structure, principles of operation of hydraulic and pneumatic elements, and to familiarize with the basic drive and control systems. In addition, the student learns the basics of designing hydraulic and pneumatic drives

Course-related learning outcomes

Knowledge

The student has extended and in-depth knowledge of physics useful for formulating and solving selected technical tasks, in particular for correct modeling of real problems

The student has an ordered, theoretically founded general knowledge of technology, transport systems and various means of transport

Skills

The student is able - in accordance with the given specification - to design (create a model of a fragment of reality), formulate a functional specification in the form of use cases, formulate non-functional requirements for selected quality characteristics) and implement a device or a widely understood system in the field of means of transport, using appropriate methods, techniques and tools

Social competences

The student is aware of the importance of knowledge in solving engineering problems, knows examples and understands the causes of malfunctioning transport systems that have led to serious financial and social losses or to serious loss of health and even life

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Written exam, completion of laboratory exercises on the basis of reports and short entrance tests.

Programme content

Principles of operation of fluid drives, basic parameters, characteristics, properties. Applications of hydraulic drives. Elements of hydraulic systems: pumps, valves, engines, actuators, accumulators. Control and regulation of hydraulic drives. Hydrostatic systems: volumetric, throttle, proportional. Hydrokinetic transmissions, hydrostatic transmissions. Hydraulic servo drives. General principles of designing hydraulic systems. Structure of the pneumatic drive and control system. Executive and control elements of pneumatic systems. Basic pneumatic drive and control systems. General principles of designing pneumatic control and drive systems

Teaching methods

Lecture with multimedia presentation. Practical classes - laboratory

Bibliography

Basic

1. Osiecki A.: Hydrostatyczny napęd maszyn. WNT, Warszawa , 2004.

2. Stryczek St.: Napęd hydrostatyczny elementy. WNT, Warszawa, 2003.

3. Stryczek St.: Napęd hydrostatyczny układy . WNT, Warszawa, 2003.

4. Szenajch W.: Napęd i sterowanie pneumatyczne WNT, Warszawa, 2003.

Additional

1. Pojazdy samochodowe napęd i sterowanie hydrauliczne. WKŁ, W-wa,1999.

2. Pr. zb. pod red. J. Świdra: Sterowanie i automatyzacja procesów technologicznych i układów mechatronicznych. Wyd. Politechniki Śląskiej, Gliwice, 2002.

Breakdown of average student's workload

	Hours	ECTS
Total workload	90	4,0
Classes requiring direct contact with the teacher	45	2,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [1]	45	2,0

[1] delete or add other activities as appropriate