



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Electrohydraulics and electropneumatics [S1Mech2>EiE]

Course

Field of study
Mechatronics

Year/Semester
3/6

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
Polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
30

Laboratory classes
30

Other
0

Tutorials
0

Projects/seminars
0

Number of credit points

4,00

Coordinators

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Lecturers

Prerequisites

Basic in the field of machine science, machine parts, engineering graphics and other areas of education in the field of study. Ordered theoretical knowledge in the field of fluid mechanics, automation.

Course objective

Understanding the structure and operating principles of conventional and proportional hydraulic and pneumatic drives and systems, as well as the components and elements used in them, and their control and monitoring, within the scope defined by the program content appropriate to the field of study.

Course-related learning outcomes

Knowledge:

Detailed knowledge of the principles of operation of hydraulic and pneumatic systems and drives, including the basics of fluid technology.

Skills:

Planning and supervision as well as service to ensure reliable operation of machines and devices as well as conducting diagnostics of hydraulic and pneumatic drives.

Social competences:

Collaboration and teamwork, taking on different roles and tasks. Awareness of the social role of a technical university graduate, and in particular understands the need for formulation and communication to the public, in particular through the mass media, information and opinions on the achievements of technology and other aspects of engineering activities; endeavors to provide such information and opinions in a generally understandable way.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Assessment for the solution of laboratory tasks, exam for the theoretical passing of the lecture part.

Programme content

Discussion of basic issues related to media and their properties, elements used in hydraulic and pneumatic drives, conventional and proportional, their medium supply, control, measurement and practical applications of pneumatic and hydraulic systems and drives.

Course topics

Introduction to fluid drives,
Discussion of elements used in the construction of pneumatic drives,
Preparation and properties of compressed air,
Pneumatic systems, design methodology and operating principles,
Discussion of elements used in the construction of hydraulic drives,
Properties of hydraulic fluids,
Hydraulic systems, design methodology and operating principles,
Control of parameters of hydraulic and pneumatic drives
Control elements in servo valves and proportional valves.
Proportional technology in hydraulics and pneumatics, including the construction of valves and their static and dynamic characteristics, methods of testing their technical characteristics.
Control path elements in proportional technology, including valve cards and measurement sensors.
Operational issues in hydraulics and assessment of oil cleanliness.

Teaching methods

1. Lecture: multimedia presentation, presentation illustrated with examples given on a board, discussion and problem analysis.
2. Laboratory exercises: conducting experiments, practical exercises, solving tasks, discussion, teamwork.

Bibliography

Basic:

1. Napęd hydrostatyczny, Stryczek S., Wydawnictwa Naukowo-Techniczne, Warszawa 1997
2. Napęd i sterowanie pneumatyczne, Szenajch W., Wydawnictwa Naukowo-Techniczne, Warszawa 1997
3. Napędy i Sterowania hydrauliczne i pneumatyczne, Tomasiak E., Wydawnictwo Politechniki Śląskiej, Gliwice 2001

Additional:

1. Katalogi producentów elementów hydraulicznych i pneumatycznych.
2. Strony internetowe producentów elementów hydraulicznych i pneumatycznych.
3. Materiały dodatkowe, udostępniane przez producentów sprzętu

Breakdown of average student's workload

	Hours	ECTS
Total workload	100	4,00
Classes requiring direct contact with the teacher	62	2,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	38	1,50