COURSE DESCRIPTION CARD - SYLLABUS

Course name

Pneumatic and hydraulic transport

Course

Field of study

Transport

Year/Semester

2/3

Area of study (specialization)

Profile of study

general academic

Level of study

Second-cycle studies

Course offered in

polish

Form of study

full-time

Requirements

compulsory

Number of hours

Lecture

15

Laboratory classes

15

Other (e.g. online)

Tutorials

15

Projects/seminars

Number of credit points

3

Lecturers

Responsible for the course/lecturer:

PhD Łukasz Semkło

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Faculty of Environmental Engineering and Energy

phone : 61 6652213

Piotrowo 3 street, 60-965 Poznan

Responsible for the course/lecturer:

Prerequisites

General technical issue of transport of gases and liquids. Some aspects of thermodynamics. Calculations transmissions liquids and gases. Predicting risk for any transporting materials transferred pneumatically and hydraulically. Working in an interdisciplinary team. Ability to lead a team and knowledge team.

Course objective

Understanding transport in pipelines: pneumatic (air) and hydraulic (water). Basis of design and the principles of construction and operation

Course-related learning outcomes

Knowledge

1. Student has advanced and in-depth knowledge of transport engineering, theoretical foundations, tools and resources used to solve simple engineering problems.

2. Student has ordered and theoretically founded general knowledge related to key issues in the field of transport engineering

Skills

1. Student is able to obtain information from literature, databases and other sources (in Polish and English), integrate them, interpret and critically evaluate them, draw conclusions and formulate and comprehensively justify opinions.

2. Student is able to communicate in Polish and English using various techniques in a professional environment and in other environments, including using issues related to transport engineering

Social competences

1. Student understands that, in the field of transport engineering, knowledge and skills are rapidly becoming obsolete.

2. Student understands the importance of using the latest knowledge in the field of transport engineering in solving research and practical problems.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture and exercises - written exam. Obtaining credit from a minimum of 51% of the points possible to get. There is a possibility of an oral question to raise the grade.

Laboratories - credit based on reports.

Programme content

Pneumatic and hydraulic Transportation, examples of applications and technical and operational requirements. Media: water and air. Pipelines: construction and technical equipment supplies. Compressor and pumping stations. Performance characteristics of the transport system. Failures pneumatic conveying systems and hydraulics. Monitoring of operation of pneumatic conveying systems and hydraulics. Loss of flow in pipelines. Issues strength. Fundamentals of building. Diagnostics operating transport systems. Fundamentals of design calculations and hydraulic pneumatic transport. The economics of exploitation. Erosion and corrosion of pipelines. Renovation of pipelines.

Teaching methods

Informative lecture (conventional) (information transfer in a systematic way)

Exercise method (subject exercises, exercises) - in the form of auditorium exercises (the application of acquired knowledge in practice - it can take a different nature: solving cognitive tasks or training psychomotor skills; transforming conscious activity into a habit through repetition)

Bibliography

Basic

Hydraulika / Jarosz A., Wołoszyn J. Państw.Wydawn.Roln.i Leśne, 1966.

Napędy i sterowania pneumatyczne - Elementy pneumatyczne - Wyznaczanie parametrów przepływowych PN-M-73763 / Polski Komitet Normalizacji, Miar i Jakości. 1992.

Podstawy pneumatyki / H. Meixner, R. Kobler. wydawnictwo Festo.

Pneumatyka : elementy i układy / Łukasz N. Węsierski. Uniwersytet Rzeszowski Katedra Mechatroniki i Automatyki, 2015

Wentylatory i pompy przepływowe / Rydlewicz Janusz. Politechnika Łódzka, 1989.

Additional

Pompy, wentylatory, dmuchawy i sprężarki wraz z sieciami / Pacholczyk Edward. Stow.Elektryków Polskich, 1980.

Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,0
Classes requiring direct contact with the teacher	45	2,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests) [1]	30	1,0

[1] delete or add other activities as appropriate