COURSE DESCRIPTION CARD - SYLLABUS

Course name

Engineering of energy transportation processes

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

part-time

Requirements

elective

Number of hours

Lecture

18

Laboratory classes

9

Other (e.g. online)

0

Tutorials

9

Projects/seminars

0

Number of credit points

2

Lecturers

Responsible for the course/lecturer:

PhD Robert Kłosowiak

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Faculty of Environmental Engineering and Energy

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Piotrowo 3 street, 60-965 Poznan

Responsible for the course/lecturer:

Prerequisites

Knowledge of the basics of machine construction and power engineering as well as the basics of thermodynamics and fluid mechanics. Construction of calculation algorithms. Calculations in Excel. Knowledge and understanding of general technical energy processes.

Course objective

Understanding the transport of energy (heat) pipelines. Steam and water heating pipelines. Basics of design and principles of construction and operation

Course-related learning outcomes

Knowledge

The student has an extended and deepened knowledge of mathematics useful for formulating and solving complex technical tasks concerning various means of transport

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 knows the basic techniques, methods and tools used in the process of solving tasks in the field of transport, mainly of an engineering nature engineering

Skills

The student is able to obtain information from various sources, including literature and databases (both in Polish and in English), integrate it properly, interpret it and critically evaluate it, draw conclusions, and comprehensively justify his/her opinion.

The student is able to properly plan and conduct perform experiments, including measurements and computer simulations, interpret the obtained results, and correctly draw conclusions

The student is able to assess the computational complexity of algorithms and transport problems

Social competences

The student understands that in technology, knowledge and skills very quickly become obsolete

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:

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.

Programme content

Pipeline heat transport. Energy carriers: hot water and steam. Heat pipelines: construction and technical operational equipment. Heating and cogeneration plants. Heat pipeline failures. Monitoring of heating pipelines operation. Telemetry. Flow losses in heating pipelines. Insulation of heat pipes. Dilatation. Strength issues. Basics of heat engineering construction techniques. Operational diagnostics of heat pipelines. Basics of design calculations of main and local heat pipelines. Economics of operation. Renovation of heat 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 - can take a different nature: solving cognitive tasks or training psychomotor skills; transforming conscious activity into a habit through repetition)

Bibliography

Basic

1. Wymiana ciepła : zadania i przykłady / pod red. B. Staniszewskiego ; [aut.: Bogusław Abramowski et al.].Państ. Wydaw. Naukowe, 1965.

2. Wymiana ciepła / Dorota Antos, Krzysztof Kaczmarski, Wojciech Piątkowski. Oficyna Wydawnicza Politechniki Rzeszowskiej, 2012.

Additional

1. Wymiana ciepła. Tablice i wykresy / Gogół Wiesław. Wydaw.PW, 1979.

Breakdown of average student's workload

	Hours	ECTS
Total workload	56	2,0
Classes requiring direct contact with the teacher	36	1,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [1]	34	1,0

[1] delete or add other activities as appropriate