



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Energy economy in the transport of gases and liquids

Course

Field of study

Year/Semester

Transport

2/3

Area of study (specialization)

Profile of study

Engineering of Pipeline Transport

general academic

Level of study

Course offered in

Second-cycle studies

Polish

Form of study

Requirements

part-time

elective

Number of hours

Lecture

Laboratory classes

Other (e.g. online)

18

Tutorials

Projects/seminars

Number of credit points

2

Lecturers

Responsible for the course/lecturer:

Responsible for the course/lecturer:

prof. dr hab. inż. E. Tuliszka-Sznitko

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Faculty of Environmental Engineering and
Energy

Piotrowo 3 street, 60-965 Poznan

Prerequisites

The student has the basic knowledge of the subjects: fluid mechanics, thermodynamics, heat exchange. The student knows how to perform basic thermodynamic flow calculations, knows how to create calculation algorithms, knows how to analyze technological diagrams. Ability to cooperate in a group, the student knows how to set priorities in the tasks set before him, demonstrates independence at work

Course objective

Understanding the principles of rational generation, processing, transport, distribution and use of energy. Gaining knowledge of the national gas network. Gaining knowledge in the field of operation and



balancing of energy systems. Deepening knowledge of the impact of technological processes on the natural environment

Course-related learning outcomes

Knowledge

has knowledge of development trends and the most important new achievements of means of transport and other selected related scientific disciplines

Skills

is able to obtain information from literature, databases and other sources (in Polish and English), integrate them, perform their interpretation and critical assessment, draw conclusions and formulate and comprehensively justify opinions

is able to use information and communication techniques used in the implementation of projects in the field of transport

can assess the usefulness and possibility of using new achievements (methods and tools) and new products of transport technology has knowledge of development trends and the most important new achievements of means of transport and other selected related scientific disciplines

Social competences

understands the importance of dissemination activities regarding the latest achievements in the field of transport engineering

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture - 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

Basic energy problems. World and national primary energy deposits. National energy system. National gas transmission system. Underground gas storage. Oil pipeline transport. Compressor stations. Thermal circuits of condensing steam power plants and combined heat and power plants; increasing the efficiency of thermal circuits. Stationary gas turbine installations. Gas-steam systems. Combined heat and electricity production. The use of renewable energy. Use of waste energy. Cost of building a power plant and generating electricity. Accumulated energy bill. Energy audit - basic definitions and rules of implementation. Expenditures and effects in projects improving the use of energy.

Teaching methods

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

Bibliography

Basic

1. Górzyński J., Audyting energetyczny, Biblioteka Fundacji Poszanowania Energii, 2000



2. Szargut J.: Termodynamika techniczna, Wyd. P. Śl. 2011
3. Laudyn D., Pawlik M., Strzelczyk F., Elektrownie, WNT Warszawa, 2000
4. Wiśniewski St.: Termodynamika techniczna, WNT 1995
5. Tuliszka E. Red.: Termodynamika techniczna. Zbiór zadań, Nr 889, Wyd. P.P.
6. Gutkowski A., Kapusta T. (red) - Zbiór zadań z termodynamiki technicznej, Skrypt PŁ, 2014

Additional

1. Szymański W., Wolańczyk F., Termodynamika powietrza wilgotnego, Oficyna Wydawnicza Politechniki Rzeszowskiej, 2008

Breakdown of average student's workload

| | Hours | ECTS |
|---|-------|------|
| Total workload | 48 | 2,0 |
| Classes requiring direct contact with the teacher | 18 | 1,0 |
| 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