COURSE DESCRIPTION CARD - SYLLABUS

Course name
Energy pipelines [S2EPiO1>RE]

Course

Field of study
Industrial and Renewable Energy Systems

Year/Semester
1/1

Area of study (specialization)
Thermal and Renewable Energy

Profile of study
general academic

Level of study
second-cycle

Course offered in
polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
30

Laboratory classes
0

Other (e.g. online)
0

Tutorials
0

Projects/seminars
15

Number of credit points

3,00

Coordinators

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Lecturers

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Prerequisites

Has extended and in-depth knowledge in the field of mathematics, optimization methods, including numerical methods used in the description of thermodynamic processes, fluid mechanics, heat, mass and momentum transfer. Is able to use his knowledge and skills to adapt existing or create new methods and tools to help solve typical engineering problems in the energy industry. He is ready to fulfill social obligations, inspire and organize activities for the social environment.

Course objective

Introduction to issues of energy systems, transmission of liquids and gases in pipelines. Mastering specialized vocabulary.

Course-related learning outcomes

Knowledge:
1. has expanded knowledge about the latest scientific discoveries in the field of power pipeline

construction and materials used [p7s_wk, ec2a_w02]
2. has expanded knowledge about the design and operation of energy pipelines and understands the economic aspects [p7s_wk, ec2a_w09]
3. knows the principles of industrial property protection (including intellectual property) as well as economic, legal and ethical conditions of activities related to the energy industry and understands the essence of the country"s energy security [p7s_wk, ec2_w11]

Skills:
1. is able to use his knowledge and skills to use the right methods and tools (including specialized software) to solve problems in energy pipelines. [p7s_uk, e2a02]
2. can formulate and test hypotheses related to simple implementation problems in energy pipeline installations [p7s_uk, e2a06]
3. is able to independently plan and implement design work related to energy pipelines [p7s_uk, e2a_u20]

Social competences:
1. is ready to recognize the importance of knowledge in solving cognitive and practical problems and to consult experts from the energy installations industry in the event of difficulties in solving the problem independently [p7s_ko, e2a_k02]
2. is ready to meet social obligations and protect the social environment at the time of designing energy pipelines [p7s_ko, e2a_k03]
3. is ready to think and act in an entrepreneurial way in energy issues [p7s_ko, e2a_k05]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

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.
Project - in order to complete the project, the lecturer should complete the project and answer the questions asked for the project.

Programme content

Construction and components of pipeline and power networks. Construction of pipeline networks such as water supply, oil pipelines and gas pipelines. Management analyzes of various types of power pipeline installations in the areas of operated transmission networks. Discussion on elements of various systems: transmission and distribution companies. Electricity, gas and oil, heat and water markets. The country"s energy security, security of supply for people and enterprises, transmission security for people and equipment, minimization of the effects of aging of networks, machines and fittings. Management tools. Economics and other criteria in transmission systems. Forecasting expansion of transmission networks. The lecture will be conducted using a multimedia presentation. Design classes will be held at the blackboard (chalk or white).

Teaching methods

Informative (conventional) lecture (transfer of information in a systematic way) - can be of course (propedeutical) or monographic (specialist) Problem lecture ("internal dialogue" of the lecturer with the student: understanding the problem, gathering premises, solving it) Conversational lecture ("external dialogue" of the lecturer with the student; students participate in solving the problem) - the continuation of the lecture may be a seminar Project method (individual or team implementation of a large, multi-stage cognitive or practical task, which results in the creation of a work)

Bibliography

Basic
1. Bęczkowski W.: Rurociągi energetyczne Część 1. Wydawnictwo Naukowo – Techniczne. Warszawa 1964
2. Bęczkowski W.: Rurociągi energetyczne Część 2. Wydawnictwo Naukowo – Techniczne. Warszawa 1965
3. Dembińska-Cyran I., Gubała M.: Podstawy zarządzania transportem w przykładach.

Wydawnictwo Instytut Logistyki i Magazynowania. Poznań 2005
4. Witold Michałowski: Rurociągi dalekiego zasięgu, Wydawnictwo Fundacja Odysseum, Warszawa 2006
Additional
1. Magda W.: Rurociągi podmorskie. Zasady projektowania. Wydawnictwo Naukowo-Techniczne. Warszawa 2004
2. Thier, Bernard: Armatura przemysłowa : elementy konstrukcyjne rurociągów, PNT CIBET, 2001.
3. Gosztowtt, Leon: Rurociągi i armatura, Państwowe Wydawnictwo Techniczne, 1953.

Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,00
Classes requiring direct contact with the teacher	45	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	30	1,00