GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Transmission of Media and Energy, PG_00066039		
Field of study	Engineering and Technologies of Energy Carriers		
Date of commencement of studies	February 2025	Academic year of realisation of subject	2024/2025
Education level	second-cycle studies	Subject group	Optional subject group Subject group related to practical vocational preparation
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	Polish
Semester of study	1	ECTS credits	2.0
Learning profile	practical profile	Assessment form	assessment
Conducting unit	Department of Energy Conversion and Storage -> Faculty of Chemistry		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Anna Kuczyńska-Łażewska	
	Teachers	dr inż. Anna Kuczyńska-Łażewska	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	10.0	0.0	15.0	0.0	0.0	25

E-learning hours included: 0.0

Learning activity and number of study hours

Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours	Self-study	SUM
Number of study hours	25	5.0	20.0	50

Subject objectives

The aim of the course is to enable students to acquire knowledge about the types and construction of water supply networks, heat sources and heat transfer to facilities, power distribution networks, types of gas networks and principles of their design and technical requirements related to the design of transmission networks.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_K05] is able to assess social problems related to the energy economy	The student is able to assess social problems related to the energy economy, key aspects of social conflicts at the level of energy generation and transmission.	[SK5] Assessment of ability to solve problems that arise in practice
[K7_W04] explains the relationships in the life cycle of technical devices and the basic processes occurring in the life cycle of devices, objects and technical systems,	The student is able to explain the relationships and complexities of LCA of energy storage and conversion equipment. He/she can identify key and sensitive aspects at different stages of the life cycle.	[SW3] Assessment of knowledge contained in written work and projects
[K7_U02] is able to plan and conduct experiments, interpret the obtained results and draw conclusions	The student is able to use the knowledge accumulated in the course to identify the key aspects that a new energy carrier should meet. Student can draw conclusions and interpret the results.	[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject
[K7_W02] identifies the problems of modern chemical engineering including the properties of energy carriers, lists the types of these carriers and outlines the prospects for their development	The student recognizes the problems of modern engineering related to energy, especially energy carriers. Student is able to list the types of energy carriers, methods of conversion and use of individual carriers and prospects for their development.	[SW3] Assessment of knowledge contained in written work and projects

Subject contents

Water and sewage networks: ·

- Water flow in branched and annular systems of water and sewage networks.
- Methods of network design, preparation of water balances, presentation of principles for the construction of water supply networks.
- Location of transmission lines, utilities of water supply networks.
- The rules for the acceptance of the installation, the basis for the operation of the existing water supply networks.
- Wastewater transport.
- Basics of sewerage network design.

System heat: ·

- Heat production.
- Design and operation of the heating network.
- Calculation of the demand for power of heating networks with high parameters.
- Thermal centers in district heating systems.
- Installation and operation of the heating network.

Gas networks:

- Types of combustible gases and their properties as well as exhaust properties.
- Types of gas networks and their equipment.
- Designing gas networks and installations.

Power networks:

- Characteristics of electrical distribution networks.
- Forecasting of electric power loads of distribution networks.
- Reliability of supply and quality of electricity.
- Operation and optimization of distribution networks

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
tests	60.0%	50.0%
project	80.0%	50.0%

Recommended reading

Basic literature

- Petrozolin W., Projektowanie sieci wodociągowych, Arkady, Warszawa, 1974
- Szpindor A., Zaopatrzenie w wodę i kanalizacja wsi, Arkady, Warszawa, 1998
- Praca zbiorowa, Przykłady obliczeń z wodociągów i kanalizacji, WSziP, Warszawa, 1983
- Denczew S., Królikowski A., Podstawy nowoczesnej eksploatacji układów wodociągowych i kanalizacyjnych, Arkady, Warszawa 2002
- Zaborowska E.: Zasady projektowania wodnych węzłów ciepłowniczych, Wydawnictwo Politechniki Gadańskiej, 2012
- Warunki techniczne projektowania, wykonania, odbioru i eksploatacji sieci ciepłowniczych z rur i elementów preizolowanych. COBRTI Instal 1996
- Kamler W.: Ciepłownictwo. PWN 1976
- Żarski K.: Obiegi wodne i parowe w kotłowniach - poradnik projektanta W-wa 2000
- Szarkowski A., Łatowki L.: Ciepłownictwo, WNT W-wa 2006
- Poradnik Inżyniera Elektryka, tom III, WNT 2011
- Kujszczyk Sz.: Elektroenergetyczne Sieci rozdzielcze, PWN, W-wa 1994;
- Kahl T.: Sieci Elektroenergetyczne, WNT, W-wa 1984
- Bąkowski K.: Gazyfikacja, WNT, Warszawa 2006
- Bąkowski K.: Sieci i instalacje gazowe, WNT, Warszawa 2008

Supplementary literature

- Catalogues of heating equipment and boilers
- Guides for the design of heating pipe networks by system manufacturers)
- Polish and Interantional Standards
- Information bulletins of the URE President

eResources addresses

Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed

Power and energy losses in power grids.

Selection of the cross-section of wires.

Calculate the demand for water, the amount of sewage, the volume of the water tank.

Work placement

Not applicable

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