



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 2027		Academic year of realisation of subject		2026/2027		
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 -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		prof. dr hab. Ewa Klugmann-Radziemska				
	Teachers						
Lesson types	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_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_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_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	Course content – lecture		
	Water and sewage networks: ·		
	<ul style="list-style-type: none">• 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: ·		
	<ul style="list-style-type: none">• 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:		
	<ul style="list-style-type: none">• 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:		
	<ul style="list-style-type: none">• 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	<ul style="list-style-type: none">• 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 Gdańskiej, 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	<ul style="list-style-type: none">• 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		
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.		
Practical activites within the subject	Not applicable		

Document generated electronically. Does not require a seal or signature.