



Subject card

Subject name and code	District heating installations, PG_00055940									
Field of study	Power Engineering, Power Engineering, Power Engineering									
Date of commencement of studies	October 2023	Academic year of realisation of subject		2025/2026						
Education level	first-cycle studies		Subject group		Optional subject group Subject group related to scientific research in the field of study					
Mode of study	Full-time studies		Mode of delivery		at the university					
Year of study	3		Language of instruction		Polish					
Semester of study	6		ECTS credits		2.0					
Learning profile	general academic profile		Assessment form		assessment					
Conducting unit	Division of Thermal Power Systems -> Institute of Energy -> Faculty of Mechanical Engineering and Ship Technology -> Faculties of Gdańsk University of Technology									
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Jacek Barański							
	Teachers		dr hab. inż. Jacek Barański							
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM			
	Number of study hours	15.0	0.0	0.0	15.0	0.0	30			
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		SUM				
	Number of study hours	30		2.0		18.0				
50										
Subject objectives	Present of knowledge and skills in the field of operation of municipal heat supply systems, including: medium-power heat source, heating network and heating substations.									
Learning outcomes	Course outcome		Subject outcome			Method of verification				
	[K6_U08] can design the basic parameters of the selected technology related to energy conversion and select auxiliary devices and evaluate the project in terms of technical and economic		The student is able to select the basic parameters of a selected heating system and choose the main and auxiliary devices used in this system, as well as evaluate the design from a technical point of view.			[SU3] Assessment of ability to use knowledge gained from the subject				
	[K6_U06] is able to use the basic knowledge on the operation of energy equipment in the field of thermal power plants, thermal and energy and heating systems, combustion engines, compressors and rotating machines to assess the technical condition of the system		The student is able to apply knowledge related to the operation of energy equipment, including thermal energy and heating systems.			[SU3] Assessment of ability to use knowledge gained from the subject				
	[K6_W10] knows the basic installations in the field of renewable energy sources and their impact on the environment		The student knows the basic installations that create heating systems and their impact on the environment.			[SW1] Assessment of factual knowledge				

Subject contents	<p>Course content – lecture Lecture:</p> <p>Overview of basic issues in the field of heating. Heat balance of the heating system. Heating plants. Heat systems. Thermal substations.</p> <p>Project:</p> <p>Heat losses in district heating installation. Calculation and heating node's elements selection.</p>									
Prerequisites and co-requisites	<p>Mathematics</p> <p>Physics</p> <p>Thermodynamics</p> <p>Fluid mechanics</p> <p>Heat transfer</p>									
Assessment methods and criteria	<table border="1"> <thead> <tr> <th data-bbox="446 929 790 961">Subject passing criteria</th><th data-bbox="790 929 1144 961">Passing threshold</th><th data-bbox="1144 929 1486 961">Percentage of the final grade</th></tr> </thead> <tbody> <tr> <td data-bbox="446 961 790 992">written test</td><td data-bbox="790 961 1144 992">56.0%</td><td data-bbox="1144 961 1486 992">80.0%</td></tr> <tr> <td data-bbox="446 992 790 1024">project</td><td data-bbox="790 992 1144 1024">56.0%</td><td data-bbox="1144 992 1486 1024">20.0%</td></tr> </tbody> </table>	Subject passing criteria	Passing threshold	Percentage of the final grade	written test	56.0%	80.0%	project	56.0%	20.0%
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written test	56.0%	80.0%								
project	56.0%	20.0%								
Recommended reading	<p>Basic literature</p> <p>1. Banieński Z., Amanowicz Ł., Ciepłownictwo. Projektowanie kotłowni i ciepłowni, Wydawnictwo Politechniki Poznańskiej 2018</p> <p>2. Nantka M. B., Ogrzewanie i ciepłownictwo, tom I, Wyd. Politechniki Śląskiej, Gliwice 2013</p> <p>3. Zaborowska E., Projektowanie kotłowni wodnych na paliwa ciekłe i gazowe, Wyd. Politechniki Gdańskiej 2018</p> <p>4. Mizielińska K., Olszak J., Gazowe i olejowe źródła ciepła małej mocy, OWPW, Warszawa 2006</p> <p>5. Krygier K., Sieci ciepłownicze, OWPW, Warszawa 2006</p> <p>6. Zaborowska E., Zasady projektowania wodnych węzłów ciepłowniczych, Wyd. Politechniki Gdańskiej, 2018</p>									
	<p>Supplementary literature</p> <p>1. Szkarowski A., Łatowski L., Ciepłownictwo, WNT, Warszawa 2006</p> <p>2. Żarski K., Obiegi wodne i parowe w kotłowniach, Warszawa 2000</p> <p>3. Krygier K., Wybrane zagadnienia z ciepłownictwa, WPW, Warszawa 1989</p> <p>4. Żarski K., Węzły cieplne w miejskich systemach ciepłowniczych, Wydawnictwo Instal, 2014</p>									
eResources addresses										

Example issues/ example questions/ tasks being completed	<p>Incompressible fluid flows in pipeline</p> <p>Pipeline pressure loss</p> <p>Heat transfer through walls</p>
Practical activites within the subject	Not applicable

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