



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 2021		Academic year of realisation of subject		2023/2024		
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	Zakład Systemów i Urządzeń Energetyki Ciepłej -> Institute of Energy -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Jacek Barański				
	Teachers		dr hab. inż. Jacek Barański				
Lesson types and methods of instruction	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		Self-study	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 design the basic parameters of the selected technology related to energy conversion and select auxiliary devices and assess the project in technical terms.		[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 in the field of renewable energy sources and their impact on the environment.		[SW1] Assessment of factual knowledge		
	[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 use the basic knowledge of the operation of power equipment in the field of thermal-energy and heating systems.		[SU3] Assessment of ability to use knowledge gained from the subject		
Subject contents	<p>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>Selection of a burner for a high thermal capacity boiler. Design of technological heat installation.</p>						

Prerequisites and co-requisites	Mathematics		
	Physics		
	Thermodynamics		
	Fluid mechanics		
	Heat transfer		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	written test	56.0%	80.0%
	project	56.0%	20.0%
Recommended reading	Basic literature	1. Bagiński Z., Amanowicz Ł., Ciepłownictwo. Projektowanie kotłowni i ciepłowni, Wydawnictwo Politechniki Poznańskiej 2018 2. Nantka M. B., Ogrzewnictwo i ciepłownictwo, tom I, Wyd. Politechniki Śląskiej, Gliwice 2013 3. Zaborowska E., Projektowanie kotłowni wodnych na paliwa ciekłe i gazowe, Wyd. Politechniki Gdańskiej 2018 4. Mizielińska K., Olszak J., Gazowe i olejowe źródła ciepła małej mocy, OWPW, Warszawa 2006 5. Krygier K., Sieci ciepłownicze, OWPW, Warszawa 2006 6. Zaborowska E., Zasady projektowania wodnych węzłów ciepłowniczych, Wyd. Politechniki Gdańskiej, 2018	
	Supplementary literature	1. Szkarowski A., Łatowski L., Ciepłownictwo, WNT, Warszawa 2006 2. Żarski K., Obiegi wodne i parowe w kotłowniach, Warszawa 2000 3. Krygier K., Wybrane zagadnienia z ciepłownictwa, WPW, Warszawa 1989 4. Żarski K., Węzły ciepłne w miejskich systemach ciepłowniczych, Wydawnictwo Instal, 2014	
	eResources addresses	Adresy na platformie eNauczanie: Instalacje ciepłownicze, W/P, E, sem.6, letni 23/24 - Moodle ID: 38461 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=38461	
Example issues/ example questions/ tasks being completed	Incompressible fluid flows in pipeline		
	Pipeline pressure loss		
	Heat transfer through walls		
Work placement	Not applicable		