



Subject card

Subject name and code	, PG_00061848						
Field of study	Environmental Engineering						
Date of commencement of studies	October 2026	Academic year of realisation of subject			2026/2027		
Education level	second-cycle studies	Subject group			Obligatory subject group in the field of study		
Mode of study	Part-time studies	Mode of delivery			at the university		
Year of study	1	Language of instruction			Polish		
Semester of study	2	ECTS credits			5.0		
Learning profile	general academic profile	Assessment form			exam		
Conducting unit	Department of Sanitary Engineering -> Faculty of Civil and Environmental Engineering -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Ewa Zaborowska				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	20.0	0.0	0.0	15.0	0.0	35
	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	35		6.0		86.0	127
Subject objectives	The aim of the course is to provide knowledge about installations related to heat sources (heating water circuits, fuel and exhaust installations, ventilation and water and sewage installations in the heat source room), legal regulations and standards, installation materials and criteria for their selection, basics of design, methods and technologies for implementing the installations in question.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	K7_U10		Can design a complex heat source		[SU5] Assessment of ability to present the results of task [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools		
	K7_U12		Can analyze, evaluate and select technical solutions of installations related with heat sources		[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject		
	K7_W06		Has in-depth, structured and theoretically based knowledge related to the hydraulics and control of systems related to heating sources		[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects		
[K7_W11] has knowledge to analyze, evaluate and optimize processes, objects and systems of environmental engineering and knows the principles of rational energy management and resources		Has the knowledge to analyze, evaluate and optimize heat sources, knows principles of rational energy management		[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects			

Subject contents	Course content – lecture Renewable energy definitions. Heat pumps. Fuel characteristics and combustion processes, boilers. Boiler technology for solid, liquid, and gaseous fuels. Hydraulic systems. Control systems. Equipment and fittings. Requirements for boiler rooms depending on the type of fuel used. Fuel storage, fuel systems. Flue gas discharge systems. Boiler room and its equipment ventilation, water and sewage systems. Fire protection. Cogeneration.		
	Course content – project Design of a complex heat source using renewable energy sources monovalent or hybrid solutions.		
Prerequisites and co-requisites	Basics of hydraulics and thermodynamics. Knowledge in the range of heating and tap hot water systems. Drawing skills in AutoCAD. Knowledge from the subjects related to heating systems at the engineering level.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Project	50.0%	50.0%
	Written exam	50.0%	50.0%
Recommended reading	Basic literature	<ol style="list-style-type: none"> 1. Pompy ciepła i efektywność energetyczna, red. D. Chwieduk, PWN 2025. 2. Pisarev V.: Projektowanie instalacji grzewczych z pompami ciepła. Politechnika Rzeszowska 2013. 3. Rubik M.: Pompy ciepła w systemach geotermii niskotemperaturowej. MULTICO Oficyna Wydawnicza, Warszawa 2011. 4. Skorek J., Kalina J.: Gazowe układy kogeneracyjne. WNT, Warszawa 2005 lub późn. 5. Zaborowska E.: Projektowanie kotłowni wodnych na paliwa ciekłe i gazowe. Wyd. PG, Gdańsk 2012 lub późn 	
	Supplementary literature	<ol style="list-style-type: none"> 1. Przepisy prawne, Polskie Normy, warunki techniczne COBRTI Instal. Zeszyt 1, 2, 4, 5, 6, 7. 2. Warunki Urzędu Dozoru Technicznego WUDT-UC-KW:2003. Urządzenia ciśnieniowe Kotle wodne. WUDT-UC-WO-A:2003. Urządzenia ciśnieniowe. Wymagania ogólne Osprzęt. 3. Wytyczne PORT PC. 4. Materiały informacyjne i poradniki, wytyczne projektowania producentów urządzeń i armatury. 5. Czasopisma branżowe (GWTS, COW, Instal, Rynek Instalacyjny i inne). 	
	eResources addresses		
Example issues/ example questions/ tasks being completed	Design of a complex heat source, including the use of renewable or hybrid energy sources.		
Practical activities within the subject	Not applicable		

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