GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	, PG_00060036		
Field of study	Environmental Engineering		
Date of commencement of studies	February 2026	Academic year of realisation of subject	2026/2027
Education level	second-cycle studies	Subject group	Optional subject group
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	Polish
Semester of study	2	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment
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	30.0	0.0	0.0	15.0	0.0	45

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	45	5.0	30.0	80

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_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
K7_U12	Can analyze and evaluate solutions and functioning 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 flow of media in heat systems	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects
K7_U10	Can design a cplex heat source	[SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools [SU5] Assessment of ability to present the results of task

<table>
<tr><td>Subject contents</td><td>Course content – lecture
Fuels, fuel installations/storage and combustion processes, boilers and boiler rooms, heat pumps, heating water circuits, combustion installations, accompanying installations in heat source rooms - ventilation, water and sewage.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>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.</td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Test</td><td>50.0%</td><td>50.0%</td></tr>
<tr><td>Project</td><td>50.0%</td><td>50.0%</td></tr>
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<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>1. Lewandowski W.M.: Proekologiczne źródła energii odnawialnej, WNT, Warszawa 2006. 2. Zaborowska E.: Projektowanie kotłowni wodnych na paliwa ciekłe i gazowe. Wydawnictwo PG, Gdańsk 2012/2013 etc. 3. Zalewski W.: Pompy ciepła sprężarkowe, sorpcyjne i termoelektryczne. IPPU Masta, Gdańsk 2001. 4. Przepisy prawne i Polskie Normy związane z tematem, warunki techniczne COBRTI Instal.</td></tr>
<tr><td>Supplementary literature</td><td>1. Nantka M.: Ogrzewnictwo i ciepłownictwo. Wydawnictwo Politechniki Śląskiej, Gliwice 2006. 2. Rubik M.: Pompy ciepła w systemach geotermii niskotemperaturowej. MULTICO Oficyna Wydawnicza, Warszawa 2011. 3. Skorek J., Kalina J.: Gazowe układy kogeneracyjne. WNT, Warszawa 2005. 4. Wiśniewski G. i in.: Kolektory słoneczne. Energia słoneczna w mieszkalnictwie, hotelarstwie i drobnym przemyśle. Dom Wydawniczy MEDIUM, Warszawa 2008. 5. Żarski K.: Obiegi wodne i parowe w kotłowniach. Poradnik projektanta. Ośrodek Informacji Technika instalacyjna w budownictwie, Warszawa 2000. 6. Wytyczne projektowania i karty katalogowe producentów.</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td>Design of a complex heat source, including the use of renewable or hybrid energy sources.</td></tr>
<tr><td>Practical activites within the subject</td><td>Not applicable</td></tr>
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