



Subject card

Subject name and code	, PG_00065745						
Field of study	Recycling and Energy Recovery						
Date of commencement of studies	October 2023		Academic year of realisation of subject		2024/2025		
Education level	first-cycle studies		Subject group		Obligatory subject group in the field of study		
Mode of study	Full-time studies		Mode of delivery		at the university		
Year of study	2		Language of instruction		Polish None		
Semester of study	4		ECTS credits		2.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Department Of Sanitary Engineering -> Faculty Of Civil And Environmental Engineering -> Wydział Politechniki Gdańskiej						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Jakub Drewnowski				
	Teachers		dr hab. inż. Jakub Drewnowski dr inż. Maria Orłowska-Szostak				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	10.0	10.0	0.0	10.0	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		0.0		0.0	30
Subject objectives	Students will gain knowledge of the available modern technical and material solutions in the field of installations and equipment. In addition to presenting theoretical knowledge, another goal of the course is to acquire practical skills for students regarding advanced design functions of selected sanitary installations as well as technologies and systems related to the recovery of raw materials and energy.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_U02] solves engineering issues and problems in the area of raw materials and energy recovery through the use of appropriate analytical, numerical and experimental tools and methods.	The student solves engineering issues and problems in the area of operation of installations and equipment, m.in. for the recovery of raw materials and energy through the use of appropriate, appropriate analytical, numerical and experimental tools and methods.	[SU5] Assessment of ability to present the results of task [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools
	[K6_U03] designs processes, technologies and systems related to the recovery of raw materials and energy, using appropriate concepts, standards and design methods.	The student is able to design processes, technologies and systems related to the recovery of raw materials and energy, applying appropriate concepts, standards and design methods.	[SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information
	[K6_W02] analyzes engineering and technological issues and problems in the area of raw materials and energy recovery using appropriate and appropriate analytical, numerical and experimental tools and methods	The student analyzes engineering and technological issues and problems in the area of raw material and energy recovery using analytical, numerical and experimental tools and methods.	[SW3] Assessment of knowledge contained in written work and projects [SW2] Assessment of knowledge contained in presentation [SW1] Assessment of factual knowledge
	[K6_W03] identifies problems and phenomena related to the recovery of raw materials and energy as well as applicable concepts, standards and design methods and is aware of their limitations.	The student is able to use acquired theoretical knowledge in order to understand the principles of operation and practical application of standards and methods for equipment and installations for the purpose of concept preparation, design, including their limitations.	[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge
Subject contents	Basic solutions in water supply networks/installations and equipment, as well as sanitary and rainwater drainage. Conventional energy sources for the purposes of hot water preparation and central heating installations as well as modern pre-insulated heating systems, including heat energy transmission. Advanced theoretical/practical and design issues in the WOD-KAN-GAZ network/installations and devices as well as functional principles in fire protection systems. Sanitation techniques using water/energy treatment/renewal and recovery systems (including industrial ones).		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Final colloquium and completion of the exercises/project.	60.0%	100.0%
Recommended reading	Basic literature	1) Chudzicki, J., Sosnowski, S. (2011). Instalacje wodociagowe projektowanie, wykonanie i eksploatacja, Wydawnictwo SeidelPrzywecki, W-wa 2) Chudzicki, J., Sosnowski, S. (2011). Instalacje kanalizacyjne projektowanie, wykonanie, eksploatacja , Wyd. Seidel-Przywecki, W-wa 3) Gassner, A. (2008). Instalacje sanitarne, Wyd. Wydawnictwa Naukowo-Techniczne, W-wa 4) Zajada, R. Instalacje gazowe na paliwa gazowe, Wyd. COBO Profil 5) Bąkowski K. (2007). Sieci i instalacje gazowe,Wyd. Wydawnictwa Naukowo-Techniczne, W-wa 6) Stec, A., Słyś, D. (2016). Instalacje ekologiczne w budownictwie mieszkaniowym Wyd. KaBe, Krosno 7) Słyś, D., Kordana,S. (2013) Odzysk ciepła odpadowego w instalacjach i systemach kanalizacyjnych Wyd. KaBe, Krosno 8) Oszczak W., (2019) Kolektory słoneczne i fotoogniwa w Twoim domu Wyd. Komunikacji i Łączności sp. z o.o. 9) Dedykowane normy i akty prawne.	
	Supplementary literature	1. Katalogi wyrobów i firmowe poradniki dla projektantów: Geberit, PipeLife, Wavin, LPM Danfoss, COMAP, PURMO, KanTherm, PoWoGaz S.A., Metron, AQUATHERM, Cuprum, COPRAX, ROCKWOOL, Thermaflex i in.	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	Development of design documentation, including drawings, and carrying out engineering calculations in the field of selected networks/installations and equipment, including those based on the use of advanced systems and the principles of sustainable development through proper water management and energy/raw material recovery.		
Work placement	Not applicable		

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