



## Subject card

Subject name and code	, PG_00060050						
Field of study	Environmental Engineering						
Date of commencement of studies	February 2024		Academic year of realisation of subject		2023/2024		
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	1		ECTS credits		2.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Department of Sanitary Engineering -> Faculty of Civil and Environmental Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Jakub Drewnowski				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	15.0	0.0	0.0	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		5.0		20.0	55
Subject objectives	Students are acquainted with modern solutions in the field of sanitary industry installations in terms of software used in the industry, especially for design purposes, as well as with new trends and solutions in installation technologies now supplied as standard by leading companies in the industry.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	K7_U12		The student assesses the abilities to employ the innovative solutions (including novel achievements in the domain of materials and devices) to optimally design sanitary installations.		[SU2] Assessment of ability to analyse information		
	[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		The student exposes enhanced background in the field of control and regulation of sanitary installations, hence, the equipment and fittings employed in regulation and control		[SW1] Assessment of factual knowledge		
	K7_U11		While conducting design work the student applies enhanced and in-depth fundamentals of hydraulics and sanitary installation design. The student makes intentional use of computer-aided design software		[SU1] Assessment of task fulfilment [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools		

Subject contents	<p>The course includes lectures and design exercises.</p> <p>LECTURES:</p> <p>Students are acquainted with modern solutions in the field of sanitary installations, and in particular with the software used in the industry for design purposes, as well as with new trends and solutions in installation technologies now supplied as standard by the leading companies of the industry.</p> <p>The subject of the lectures here is not only *software, but:</p> <p>-the technologies used in plant control (static fittings, direct-acting fittings, freely programmable controllers and corresponding control algorithms),</p> <p>-circulating systems of ventilation heaters and coolers (parameters, equipment and fittings, hydraulic control ).</p> <p>- Hydrant systems, sprinkler systems, sprinkler systems (for each system separately: application, design principles, operation). Connection of fire-fighting systems to the water supply system; priority valve/priority valve.</p> <p>- The latest installation materials offered by the mentioned companies (also their advantages, ways of installation), etc.</p> <p>DESIGN:</p> <p>As part of the design activity, students perform the design of a water supply system with central hot water preparation and the design of a sanitary sewage system for a multi-family residential building with the help of professional software to support the engineer's work.</p> <p>Translated with <a href="http://www.DeepL.com/Translator">www.DeepL.com/Translator</a> (free version)</p>											
Prerequisites and co-requisites	<p>The course is an extension of the course Sanitary Installations I taught in the fifth semester of full-time undergraduate studies of Environmental Engineering. The student taking the course should have a structured, theoretically supported knowledge related to the design of sanitary installations.</p>											
Assessment methods and criteria	<table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td>Written test from lectures</td><td>65.0%</td><td>50.0%</td></tr><tr><td>Design exercise</td><td>65.0%</td><td>50.0%</td></tr></table>	Subject passing criteria	Passing threshold	Percentage of the final grade	Written test from lectures	65.0%	50.0%	Design exercise	65.0%	50.0%		
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Written test from lectures	65.0%	50.0%										
Design exercise	65.0%	50.0%										
Recommended reading	Basic literature	1. Academic and designer textbooks										
		2.Current standards, applicable regulations and guidelines, in particular: Warunki Techniczne Wykonania i Odbioru Robót Budowlano Montażowych, Tom II: Instalacje Sanitarne i Przemysłowe, ARKADY, Warszawa 1988 oraz Wymagania Techniczne COBRTI INSTAL zeszyt 1-10, Warszawa, 1999 do 2005										
	Supplementary literature	3.Product catalogs and company guides for designers: Geberit, PipeLife, Wavin, LPM Danfoss, COMAP, PURMO, KanTherm, PoWoGaz S.A., Metron, AQUATHERM, Cuprum, COPRAX, ROCKWOOL, Thermaflex i in.;										
		4. Articles in professional journals										
	eResources addresses	Adresy na platformie eNauczanie:										
Example issues/ example questions/ tasks being completed	<p>Discussion of the design of central hot water circulation control (classic variant and variant with TOCCW).</p> <p>Discussion of pressure regulation of water supply installation.</p> <p>Demonstration of sample design solutions by designers/practitioners with years of experience in sanitary system design.</p>											
Work placement	Not applicable											

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