



## Subject card

Subject name and code	, PG_00060050						
Field of study	Environmental Engineering						
Date of commencement of studies	February 2023	Academic year of realisation of subject			2022/2023		
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 inż. Maria Orłowska-Szostak					
	Teachers	dr inż. Maria Orłowska-Szostak dr inż. Ryszard Orłowski dr hab. inż. Ewa Zaborowska mgr inż. Natalia Janowicz					
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_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			[SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU1] Assessment of task fulfilment		
	[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_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		

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> <ul style="list-style-type: none"> <li>-the technologies used in plant control (static fittings, direct-acting fittings, freely programmable controllers and corresponding control algorithms),</li> <li>-circulating systems of ventilation heaters and coolers (parameters, equipment and fittings, hydraulic control ).</li> <li>- 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.</li> <li>- The latest installation materials offered by the mentioned companies (also their advantages, ways of installation), etc.</li> </ul> <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 border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33%;">Subject passing criteria</th> <th style="width: 33%;">Passing threshold</th> <th style="width: 33%;">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td>Design exercise</td> <td>65.0%</td> <td>50.0%</td> </tr> <tr> <td>Written test from lectures</td> <td>65.0%</td> <td>50.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Design exercise	65.0%	50.0%	Written test from lectures	65.0%	50.0%
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Design exercise	65.0%	50.0%										
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Recommended reading	Basic literature	<p>1. Academic and designer textbooks</p> <p>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</p>										
	Supplementary literature	<p>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.;</p> <p>4. Articles in professional journals</p>										
	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											