



## Subject card

Subject name and code	Sanitary equipment of houses I, PG_00043371						
Field of study	Environmental Engineering						
Date of commencement of studies	October 2020		Academic year of realisation of subject		2022/2023		
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	3		Language of instruction		Polish		
Semester of study	5		ECTS credits		4.0		
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. Ryszard Orłowski				
	Teachers		dr inż. Maria Orłowska-Szostak				
			dr inż. Dominika Sobotka				
			dr inż. Ryszard Orłowski				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	15.0	0.0	15.0	0.0	60
	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	60		5.0		45.0	110
Subject objectives	The purpose of the subject is familiarization students with some individual kind of sanitary installation, construction of these systems, employment , project principles, advantages and disadvantages of individual solutions and technologies and taking advantage of this knowledge in professional practice of sanitary engineer.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_U07] can read architectural, construction and geodesy drawings, and can use the known computer programs to prepare a drawing part of technical documentation for the sanitary industry	Is able to make use of professional architectonic - construction base drawings in his design works. Drawing part of engineering documentation of sanitary sector is able to execute with utilization of proper professional software.	[SU1] Assessment of task fulfilment
	[K6_W07] has a structured and theoretically founded knowledge in the field of materials used in the sanitary industry, their physico-chemical properties; knows and understands the basic processes of their production	When designing sanitary installations is able to use the fully purchased knowledge in the scope of installation materials.	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects
	[K6_U06] knows and applies the basic provisions of construction law, water law and environmental law	Elaborating projects from a range of indoor sanitary installation he is able to use all current law regulations in civil engineering.	[SU1] Assessment of task fulfilment
	[K6_U12] can design installations, networks and facilities: water supply, sewage, heating and gas	He can design installations of high advanced complexity.	[SU1] Assessment of task fulfilment
	[K6_U03] can prepare documentation regarding the implementation of an engineering task/project and prepare a text or presentation including a discussion of the results of the implementation	It is able to prepare project documentation and to substantiate adopted project solutions in time of defense /presentation of project.	[SU1] Assessment of task fulfilment [SU3] Assessment of ability to use knowledge gained from the subject
	[K6_W09] has ordered, theoretically founded knowledge in the field of water supply, sewage, heating, ventilation and air conditioning, and the principles of shaping the microclimate of rooms; knows legal regulations, standardization issues and recommendations for the design of water supply, sewage, heating and gas networks and installations	Knows current norms polish standard and PN-EN and current dispositions and directions (guidelines) with reference to project design of any sanitary installations.	[SW3] Assessment of knowledge contained in written work and projects
Subject contents	LECTURES Discussing of wide literature of the subject. Kinds of outdoor networks of municipal infrastructure and of Indoor installations. Stepless regulation of pump discharge: theoretical basis. Cold water supply installations: Introduction (engineering materials, technologies, required inlet pressure). Installations supplied indirectly from the pipe of municipal water supply system: without using of pressure reducing valve (PRV) and with the use of it. High buildings supplied with water with the use of steplessly controlled pumps; evaluation and comparison of some different cases. Zoning of pressure in an installation. Hot water supply installations: Kinds of hot water systems. Installations of individual conditioning of hot water. Central conditioning of hot water: engineering materials, typical schemes of the installation and manners of regulation of hot water circulation Systems of central heating: Engineering materials, kinds of heating systems, typical schemes of the central heating installation and manners of its regulation. Sewage system installations: typical technical solutions depending on the height of building. Systems of rain-water installation: technical materials, typical technical solutions, vacuum installations. Gas installation: Actual tendencies, methods of calculation. Pressure and vacuum outdoor sewage systems: application, basic rules of design. AUDITORIAL CLASSES Rules of dimensioning and exemplary calculations for the installations such as: supply, sewage, rain-water and gas; application of professional computer programs. ENGINEERING DESIGN CLASSES Design of sanitary installations for an apartment building.		
Prerequisites and co-requisites	Passed the basic program of building engineering. Passed the basic program of installations in building engineering.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	exercises	60.0%	10.0%
	design	85.0%	30.0%
	written exam	60.0%	60.0%
Recommended reading	Basic literature	1.Sosnowski S., Tabernacki J., Chudzicki J.: Instalacje wodociągowe i kanalizacyjne. Wyd. Instalator Polski, Warszawa, 2000. 2. Poradnik: Instalacje wodociągowe, kanalizacyjne i gazowe. Praca zbiorowa pod red. M. Chudzickiego, Arkady, Warszawa, 1976. 3. Krygier K., Klinke T., Seweryniuk J.: Ogrzewnictwo, wentylacja, klimatyzacja. Wyd. Szkolne i Pedagogiczne SA, Warszawa, 2000. 4. K. Bąkowski, J. Bartuś, R. Zajda: Projektowanie instalacji gazowych, Arkady, Warszawa, 1976	
	Supplementary literature	Catalogues of products and company guides for designers: Geberit Danfoss, COMAP, PURMO, KanTherm, PoWoGaz S.A., Metron AQUATHERM (fusiotherm), Cuprum, COPRAX, ROCKWOOL (Thermorock), Thermaflex PipeLife, Wavin i in. (w większości dostępne w Internecie). 2. Obowiązujące liczne normy, przepisy i wytyczne podane na wykładzie.	

	eResources addresses	Adresy na platformie eNauczenie: Instalacje sanitarne I - stacjonarne_2022/2023 - Nowy - Moodle ID: 25014 <a href="https://enauczenie.pg.edu.pl/moodle/course/view.php?id=25014">https://enauczenie.pg.edu.pl/moodle/course/view.php?id=25014</a>
Example issues/ example questions/ tasks being completed	Names and destination of some basic professional software for computer aided design of sanitary installation.  Connection of water-supply installation for wire of water-supply network.  Materials applicable in water-supply installations.  Fire-protection installations in buildings.  Gas Installations material, gas meters.  Installations of warm waters classification, regulation.  Heating installations classification, regulation.	
Work placement	Not applicable	