GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	, PG_00059185		
Field of study	Environmental Engineering		
Date of commencement of studies	October 2022	Academic year of realisation of subject	2024/2025
Education level	first-cycle studies	Subject group	Obligatory subject group in the field of study Subject group related to scientific research in the field of study
Mode of study	Part-time studies	Mode of delivery	at the university
Year of study	3	Language of instruction	Polish
Semester of study	5	ECTS credits	7.0
Learning profile	general academic profile	Assessment form	exam
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. Ryszard Orłowski dr inż. Przemysław Kowal	

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	20.0	0.0	0.0	25.0	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	10.0	120.0	175

Subject objectives	The aim of the course is to familiarize students with individual types of building sanitary installations, their application, construction, design principles, advantages and disadvantages of individual solutions and technologies in terms of using this knowledge in the professional practice of a sanitary engineer.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U12] can design installations, networks and facilities: water supply, sewage, heating and gas	Is able to design complex sanitary installations (cold water, hot water, sanitary sewage, storm sewage, dual installations, gas installations, water heating installations).	[SU3] Assessment of ability to use knowledge gained from the subject [SU1] Assessment of task fulfilment
[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	Has structured theoretical knowledge regarding the principles of dimensioning and operation of designed sanitary installations. Knows the current PN and PN-EN standards as well as current regulations and guidelines regarding the design of sanitary installations.	[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge
[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	He can use professional architectural and construction foundations as a basis for design. Is able to prepare drawings of technical documentation for the sanitary industry using appropriate professional computer programs.	[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment
[K6_U06] knows and applies the basic provisions of construction law, water law and environmental law	When designing internal installations, he knows and is able to apply all current construction law and environmental protection law	[SU2] Assessment of ability to analyse information [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 carrying out projects in the field of internal installations, he can fully use the acquired knowledge of the features and applications of installation materials.	[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge

Subject contents

LECTURES: Discussion of extensive literature on the subject. Division of sanitary networks and installations. Smooth regulation of pump operation: general theoretical principle. Installations incl.: Introduction (materials and technologies used, required inlet pressure). Buildings powered directly from the city network (without Pressure Reduction Valve, using Pressure Reduction Valve). Tall buildings, powered by a pump with an inverter; evaluation and comparison of various solutions for smooth regulation. Pressure zoning in installations. Hot water installations: Division of hot water devices. Individual hot water preparation. Central hot water preparation; materials, technologies, typical schemes of installation and regulation of circulation in central hot water. Central heating installations: Materials used, division of heating devices, typical schemes of installation and regulation of central hot water. Sanitary sewage installations: solutions depending on the height of the building. Rainwater drainage installations: materials, typical solutions, vacuum drainage installation. Gas installations: Current trends; computational methods. Pressure and vacuum sewage networks: Application, basic design principles. AUDITORY EXERCISES: Principles of dimensioning and calculation examples of water supply installations, sanitary sewage installations, rainwater installations and gas installations. DESIGNING: Use of professional computer programs. Design of internal installations for a medium-sized residential building.

Prerequisites and co-requisites

Passed basic program in the field of sanitary installations and general construction.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
written exam	60.0%	60.0%
exercises	60.0%	10.0%
design	85.0%	30.0%

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,197 4. Ścieranka Grzegorz: Przeciwpożarowe instalacje hydrantowe. Nowe przepisy. Rynek Instalacyjny 10/201 5. Zajda Ryszard: Instalacje gazowe na paliwa gazowe. Warunki techniczne z komentarzami. Wymagania odbioru i użytkowania. Przepisy prawne i normy. Wydawnictwo: Cobo-Profil, 2003 Wydanie 4
	Supplementary literature	1. Katalogi wyrobów i firmowe poradniki dla projektantów: 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.Orłowska-Szostak M., Orłowski R.: Cyrkulacja w instalacjach centralnej ciepłej wody użytkowej; budowa modelu komputerowego, algorytmy wymiarowania i sposoby regulacji, Wydawnictwo Politechniki Gdańskiej, Gdańsk 2016 r. 3.Ewa Zaborowska: Zasady projektowania wodnych węzłów ciepłowniczych , Wydawnictwo Politechniki Gdańskiej, Gdańsk (wyd.7) 2019 4.Orłowski R.: Techniczne i ekonomiczne aspekty płynnego sterowania pracą pomp w systemach i instalacjach wodociągowych, kanalizacyjnych, ciepłej wody i c. o.. Gaz Woda i Technika Sanitarna, nr 12/1999. p. 449-458 5.Firmowe katalogi techniczne aktualnej armatury regulacyjnej i automatyki instalacyjnej oraz firmowe poradniki dla inżynierów dostępne m.in. w Internecie**:** instalacji i sieci wodociągowych (głównie GRUNDFOS)**:** instalacji wodnych grzewczych i cieplej wody (głównie Danfoss
	eResources addresses	Podstawowe https://enauczanie.pg.edu.pl/moodle/course/view.php?id=32477 - Address on the eNauczanie Instalacje Wewenene platform, engineering sem.5 - niestacjonarne_2023/2024 - Moodle ID: 32477 Adresy na platformie eNauczanie: Instalacje Wewnętrzne, inżynierskie sem.V - niestacjonarne_2024/2025 - Moodle ID: 40346 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=40346

Example issues/ example questions/ tasks being completed	Names and purposes of basic professional computer programs supporting the design of sanitary construction installations. Connecting the water supply system to the municipal water supply network. Materials used in water supply installations. Fire protection installations in buildings. Gas installations, materials, gasmeters. Hot water installations, division and regulation. Heating installations, division and regulation
Work placement	Not applicable

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