GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Water supply and sewage systems, PG_00043512						
Field of study	Environmental Engineering						
Date of commencement of studies	October 2020		Academic year of realisation of subject	2023/2024			
Education level	first-cycle studies		Subject group	Optional subject group Subject group related to scientific research in the field of study			
Mode of study	Full-time studies		Mode of delivery	at the university			
Year of study	4		Language of instruction	Polish			
Semester of study	7		ECTS credits	5.0			
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		prof. dr hab. inż. Ewa Wojciechowska				
	Teachers		prof. dr hab. inż. Ewa Wojciechowska				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	30.0	0.0	15.0	0.0	60
	E-learning hours included: 0.0						
	Address on the e-learning platform: https://enauczanie.pg.edu.pl/moodle/course/view.php?id=13099&notifyeditingon=1						
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		8.0	60.0	128	
Subject objectives	The objective of the course is to extend the student's knowledge on water supply and wastewater collection systems, their design, operation and exploitation.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U08] can use properly selected methods and devices of hydraulics and hydrology, enabling determination of basic quantities characterizing the flow of water in open channels and rivers, pipelines and flow objects of environmental engineering	Student knows the calculation methods to determine the flow rates in urban drainage systems	[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment
[K6_U16] can, when formulating and solving engineering tasks in environmental engineering, evaluate, select and apply appropriate methods and tools, recognize their non-technical aspects, including environmental, economic and legal aspects	Student knows and uses correct methods of designinig of water supply and sewerage systems, uses computation methods and computer tools in the designing process	[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_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	Student knows the construction, functioning and explotation of water supply systems, sewerage systems and drainage systems	[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge
[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	Student can make a project of water supply system, sewre system, household connection consisting of necessary technical descriptions, descritption of computation methods and technical drawings.	[SU5] Assessment of ability to present the results of task [SU1] Assessment of task fulfilment

Subject contents

Lecture:

Stormwater. Rainfall genesis, spatial and temporal variability. Climate changes.Calculation models. Consequences of using of simple models. Stormwater in urban areas. Consequences of urbanization, methods of adaptation. What is Sustainable Urban Drainage System? Infitration of stormwater. Retention of stormwater. Bioretention, Green Infrastructure. Stormwater harvesting and reuse. Odours in sewerage systems, prevention methods.

Exercises:

Elaboration of schemes and details of calculation nodes in water supply network. The vacuum system of roof draining. Computer program Kreślarz for elaboration and edition of longitudinal profiles of sanitary sewers.

Project:

Project of house connections to water supply system, sewerage network and urban drainage together with administrative arrangements. Analysis of dual sewer installation in a house.

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
	50.0%	35.0%
	50.0%	30.0%
	50.0%	35.0%

Recommended reading	Basic literature	Edel R. Odwodnienie dróg. Wyd. Komunikacji i Łączności, Warszawa 2008 Geiger W., Dreiseitl H. Nowe sposoby odprowadzania wód deszczowych. Wyd. Projprzem-EKO, Bydgoszcz 1999 Kotowski A. Podstawy bezpiecznego projektowania odwodnień budynków. Wydawnictwo Seidel Przywecki, Warszawa 2011 Królikowska J., Królikowski A. Wody opadowe. Odprowadzanie, zagospodarowanie, podczyszczanie i wykorzystanie. Wyd. Seidel-Przywecki 2012 Słyś D. Zrównoważone systemy odwadniania miast. Dolnośląskie Wyd. Edukacyjne, Wrocław 2013 Weinerowska Bords K. Rola uproszczeń w modelach obliczeniowych kanalizacji deszczowej. Wyd. Politechniki Gdańskiej, Gdańsk 2010 Wojciechowska i in. Zrównoważone systemy gospodarowania wodą deszczową. Wyd. Politechniki Gdańskiej 2015
	Supplementary literature	Hasan Volkan Oral, Pedro Carvalho, Magdalena Gajewska, Nadia Ursino, Fabio Masi, Eric D. van Hullebusch, Jan K. Kazak, Alfonso Exposito, Giulia Cipolletta, Theis Raaschou Andersen, David Christian Finger, Lena Simperler, Martin Regelsberger, Vit Rous, Matej Radinja, Gianluigi Buttiglieri, Pawel Krzeminski, Anacleto Rizzo, Kaveh Dehghanian, Mariyana Nikolova, Martin Zimmermann; A review of nature-based solutions for urban water management in European circular cities: a critical assessment based on case studies and literature. *Blue-Green Systems* 1 January 2020; 2 (1): 112136. doi: https://doi.org/10.2166/bgs.2020.932
	eResources addresses	Adresy na platformie eNauczanie: Wodociągi i Kanalizacja sem. 7 - Moodle ID: 34476 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=34476
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	