



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 designing 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 exploitation 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, sewer system, household connection consisting of necessary technical descriptions, description of computation methods and technical drawings.	[SU5] Assessment of ability to present the results of task [SU1] Assessment of task fulfilment	
Subject contents	<p>Lecture:</p> <p>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? Infiltration of stormwater. Retention of stormwater. Bioretention, Green Infrastructure. Stormwater harvesting and reuse. Odours in sewerage systems, prevention methods.</p> <p>Exercises:</p> <p>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.</p> <p>Project:</p> <p>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.</p>		
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	<p>Edel R. Odwodnienie dróg. Wyd. Komunikacji i Łączności, Warszawa 2008</p> <p>Geiger W., Dreiseitl H. Nowe sposoby odprowadzania wód deszczowych. Wyd. Projprzem-EKO, Bydgoszcz 1999</p> <p>Kotowski A. Podstawy bezpiecznego projektowania odwodnień budynków. Wydawnictwo Seidel Przywecki, Warszawa 2011</p> <p>Królikowska J., Królikowski A. Wody opadowe. Odprowadzanie, zagospodarowanie, podczyszczanie i wykorzystanie. Wyd. Seidel-Przywecki 2012</p> <p>Słyś D. Zrównoważone systemy odwadniania miast. Dolnośląskie Wyd. Edukacyjne, Wrocław 2013</p> <p>Weinerowska Bords K. Rola uproszczeń w modelach obliczeniowych kanalizacji deszczowej. Wyd. Politechniki Gdańskiej, Gdańsk 2010</p> <p>Wojciechowska i in. Zrównoważone systemy gospodarowania wodą deszczową. Wyd. Politechniki Gdańskiej 2015</p>
	Supplementary literature	<p>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. <i>Blue-Green Systems</i> 1 January 2020; 2 (1): 112136. doi: https://doi.org/10.2166/bgs.2020.932</p>
	eResources addresses	<p>Adresy na platformie eNauczanie:</p> <p>Wodociągi i Kanalizacja sem. 7 - Moodle ID: 34476 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=34476</p>
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	