



Subject card

Subject name and code	, PG_00058820						
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		
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			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		prof. dr hab. inż. Ewa Wojciechowska				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	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	0.0		20.0		50
Subject objectives	The aim of the course is to provide knowledge regarding the construction, design and operation of sewage systems, as well as material and armament solutions used in the sewage systems. The course allows for acquisition of skills in design, calculations, selection of armament, the use of literature, databases, manufacturers' catalogues, as well as the perception of environmental and social aspects.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[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		The student knows the types of sewage networks, the principles of designing a distribution sewage network and the principles of network operation.		[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects		
	[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		The student knows the materials and utilities of the sewage network and is able to choose the appropriate material of pipes and utilities depending on the type of network and terrain conditions.		[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects		
Subject contents	Classification of sewage systems due to the joint and separate discharge of domestic sewage and stormwater. Gravitational, gravity-pressure, pressure and vacuum sewage systems. Quantitative assessments of domestic and industrial wastewater and stormwater. Types and shapes of canal cross-sections. Sewage pipes - material and construction solutions - traditional and new. Cooperation of the conduit with the soil medium, principles of foundation of conduits. Hydraulic calculations of gravity sewers. Sewerage utilities: inspection manholes, cascade manholes, rain drains, storm overflows, separators, siphons. Sewage pumping stations. Operation and maintenance. Trenchless techniques for the construction and renovation of sewer pipes. Sustainable methods of rainwater management.						
Prerequisites and co-requisites							
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
			50.0%		100.0%		

Recommended reading	Basic literature	<p>Edel R.: Odwodnienia drogowe. WKiŁ Warszawa 2008</p> <p>Imhoff K., Imhoff K.-R.: Kanalizacja miast i oczyszczanie ścieków. Poradnik. Projprzem-EKO, Bydgoszcz 1996</p> <p>Kotowski A.: Podstawy bezpiecznego projektowania kanalizacji. Wydawnictwo Seidel Przywecki, Warszawa 2012</p> <p>Kanalizacja. Praca zbiorowa pod red. Z.Suligowskiego. Wydawnictwo Seidel Przywecki, Warszawa 2012</p> <p>Technologie bezwykopowe w inżynierii środowiska. Praca zbiorowa pod red. A.Kulickowskiego. Wydawnictwo Seidel Przywecki, Warszawa 2010</p>
	Supplementary literature	<p>Kotowski A., Kaźmierczak B., Damcewicz A.: Modelowanie opadów do wymiarowania kanalizacji Polska Akademia Nauk. Komitet Inżynierii Lądowej i Wodnej. Instytut Podstawowych Problemów Techniki. Studia z zakresu inżynierii. Nr 68. Warszawa 2010</p> <p>Dziopak J.: Analiza teoretyczna i modelowanie wielokomorowych zbiorników kanalizacyjnych. Politechnika Krakowska, Kraków 1992</p> <p>Kwietniewski M.: GIS w wodociągach i kanalizacji. PWN Warszawa 2008</p> <p>Kulickowski A.: Projektowanie konstrukcji przewodów kanalizacyjnych. Politechnika Świętokrzyska Skrypty, Kielce 2000</p> <p>Kulickowski A.: Rury kanalizacyjne t. I: Własności materiałowe. Politechnika Świętokrzyska - Monografie, Kielce 2001</p>
	eResources addresses	<p>Adresy na platformie eNauczanie:</p> <p>Infrastruktura kanalizacyjna - 5 semestr rok akad 2024/25 - Moodle ID: 29879  <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=29879">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=29879</a></p>
Example issues/ example questions/ tasks being completed	<p>Obliczenie ilości ścieków bytowych lub wód opadowych dla wybranej zlewni.</p> <p>Rozwiązania materiałowe przewodów kanalizacyjnych w zależności od przeznaczenia sieci.</p>	
Work placement	Not applicable	

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