



## Subject card

Subject name and code	Facilities for wastewater treatment , PG_00048006						
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			Obligatory subject group in the field of study		
Mode of study	Part-time studies	Mode of delivery			at the university		
Year of study	4	Language of instruction			Polish		
Semester of study	7	ECTS credits			4.0		
Learning profile	general academic profile	Assessment form			exam		
Conducting unit	Department of Environmental Engineering Technology -> Faculty of Civil and Environmental Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Krzysztof Czerwionka					
	Teachers	dr hab. inż. Krzysztof Czerwionka mgr inż. Anna Wilińska-Lisowska					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	5.0	0.0	10.0	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	5.0		80.0	115	
Subject objectives	The aim of the course is to learn the principles of designing wastewater treatment plants						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K6_U10] can design basic equipment for water treatment, wastewater treatment and sludge and waste management	The student is able to design devices for a municipal wastewater treatment plant			[SU5] Assessment of ability to present the results of task [SU3] Assessment of ability to use knowledge gained from the subject		
	[K6_W14] has a structured knowledge of current legal regulations regarding environmental protection, water and construction law; knows the basics of public procurement law, patent law, intellectual property protection and labor protection	The student is able to use legal regulations to design wastewater treatment plants.			[SW3] Assessment of knowledge contained in written work and projects		
	[K6_W03] has a structured and theoretically founded knowledge in the field of chemistry and biology, including knowledge necessary to understand the technological processes related to water treatment, wastewater treatment, waste management and sludge management	The student is able to choose the devices of the wastewater treatment plant depending on the required parameters of the quality of the treated wastewater			[SW3] Assessment of knowledge contained in written work and projects		
	[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	The student is able to prepare a project of a municipal wastewater treatment plant			[SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU1] Assessment of task fulfilment		
Subject contents	Basic concepts, definitions, terminology. Legal requirements for wastewater treatment. The scope of the design of the wastewater treatment plant and its basic components. Raw wastewater balance. Flow resistance as the basis for the construction of the height scheme. Equipment for mechanical wastewater treatment - general characteristics of grates, sand traps and settling tanks. Facilities for biological wastewater treatment.						

Prerequisites and co-requisites	Knowledge of the processes used in water and wastewater technology		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	final exam	60.0%	60.0%
	project execution	60.0%	40.0%
Recommended reading	Basic literature	<p>1. Henze M., Harremoës P., Jes la Cour J., Arvin E. Oczyszczanie ścieków, procesy biologiczne i chemiczne Wydawnictwo Politechniki Świętokrzyskiej w Kielcach, 2002</p> <p>2. Anielak A. Chemiczne i fizykochemiczne oczyszczanie ścieków PWN Warszawa 2000</p> <p>3. Kowal A., Świdarska-Bróż M.: Oczyszczanie wody. Wyd. Nauk. PWN, Warszawa-Wrocław, 1996.</p>	
	Supplementary literature	<p>1. Heidrich Z.: Urządzenia do uzdatniania wody. Zasady projektowania i przykłady obliczeń. Arkady, W-wa, 1980.</p> <p>2. Heidrich Z., Witkowski A. Urządzenia do oczyszczania ścieków. Projektowanie. Przykłady obliczeń Wydawnictwo Seidel-Przywecki Warszawa 2005</p>	
	eResources addresses	<p>Adresy na platformie eNauczenie:</p> <p>Urządzenia do oczyszczania ścieków - 2023/2024 - Moodle ID: 30052  <a href="https://enauczenie.pg.edu.pl/moodle/course/view.php?id=30052">https://enauczenie.pg.edu.pl/moodle/course/view.php?id=30052</a></p>	
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		