



Subject card

Subject name and code	Water and wastewater treatment devices , PG_00043513						
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 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	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/index.php?id=7533						
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 aim of the course is to familiarize yourself with the design of water and wastewater treatment plant.						
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 wastewater sewage 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 design legislation water treatment plants and wastewater treatment plants.			[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 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		
	[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 understands the rules of technological processes application in water treatment stations and wastewater treatment plants. The student is able to describe the technological processes used in water treatment stations and wastewater treatment plants			[SW3] Assessment of knowledge contained in written work and projects		

Subject contents	Basic concepts, definitions and terminology. General established treatment of surface and groundwater. Legal requirements for water and wastewater treatment . Scope of project water and wastewater treatment plants - the basic components. Flow resistance as the basis for design pattern pitch . Mechanical water and wastewater treatment - general characteristics of the grinders, grit chambers, settling tanks and filters. Implementation of coagulation - equipment and principles of design. Objects for biological wastewater treatment		
Prerequisites and co-requisites	Knowledge of processes used in water and wastewater treatment technology		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Midterm colloquium	60.0%	60.0%
	Project	60.0%	40.0%
Recommended reading	Basic literature	1. Kowal A., Świdarska-Bróż M.: Oczyszczanie wody. Wyd. Nauk. PWN, Warszawa-Wrocław, 1996. 2. Anielak A. Chemiczne i fizykochemiczne oczyszczanie ścieków PWN Warszawa 2000 3. Henze M., Harremoës P., Jes la Cour J., Arvin E. Oczyszczanie ścieków, procesy biologiczne i chemiczne Wydawnictwo Politechniki Świętokrzyskiej w Kielcach, 2002	
	Supplementary literature	1. Heidrich Z.: Urządzenia do uzdatniania wody. Zasady projektowania i przykłady obliczeń. Arkady, W-wa, 1980. 2. Heidrich Z., Witkowski A. Urządzenia do oczyszczania ścieków. Projektowanie. Przykłady obliczeń Wydawnictwo Seidel-Przywecki Warszawa 2005	
	eResources addresses	Adresy na platformie eNauczenie: Urządzenia do oczyszczania wody i ścieków - 2023/2024 - Moodle ID: 30053 https://enauczenie.pg.edu.pl/moodle/course/view.php?id=30053	
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		