

表 GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Water and Waste-water Technology II, PG_00042694								
Field of study	Environmental Engineering								
Date of commencement of studies	October 2021		Academic year of realisation of subject			2023/2024			
Education level	first-cycle studies		Subject group			Obligatory subject group in the field of study			
						Subject group related to scientific research in the field of study			
Mode of study	Part-time studies		Mode of delivery			at the university			
Year of study	3		Language of instruction			Polish			
Semester of study	6		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						
		dr inż. Alina Wargin							
Lesson types and methods	Lesson type	Lecture	Tutorial	Laboratory	Projec	t	Seminar	SUM	
of instruction	Number of study hours	16.0	0.0	18.0	0.0		0.0	34	
	E-learning hours included: 0.0								
Learning activity and number of study hours	Learning activity Participation ir classes includ plan		a didactic Participation in consultation hours		Self-study SUM				
	Number of study hours	34		5.0		62.0		101	
Subject objectives	Presentation of the basic scope of knowledge concerning the issues of quantity and quality of municipal wastewater and knowledge of the unit processes used for their treatment.								
Learning outcomes	Course outcome		Subject outcome			Method of verification			
	[K6_U01] has the ability to self- education, can obtain information from literature, databases and other sources, uses information technology, Internet resources; can integrate the obtained information, make their interpretation, as well as draw conclusions and formulate and justify opinions		Student understands the need to update knowledge in the field of wastewater characteristics and its impact on the selection of unit processes for pollutants removal			[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_U09] is able to use well- chosen methods and measuring devices that enable determination of basic parameters of the water treatment process and wastewater treatment; can perform simple laboratory tests leading to the assessment of water quality, pollutant load in sewage[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, waste management and sludge management		Student is able to use the knowledge of chemistry and biology in order to evaluate the effectiveness of the processes used for wastewater treatment			present the results of task [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 [SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge				

Subject contents	Lecture: Basic concepts and definitions. Indicators and criteria for assessing the quality of wastewater. Pollution loads. Discharge of sewage into the environment: sewage receivers, legal conditions.Technological processes of mechanical wastewater treatment. Basics of biological wastewater treatment: microbiological composition, development of bacterial culture. Biological unit processes: hydrolysis, oxidation, ammonification, nitrification, denitrification, biological dephosphatation. Technological parameters of the activated sludge method. Basic technological systems of biological wastewater treatment. Natural methods of sewage treatment: biological ponds, soil and plant treatment plants, household sewage treatment plants. Modern methods of nitrogen removal: partial nitrification / denitrification, anammox, deammonification.Laboratory exercises:						
	Study of the wastewater COD fraction wastewater contaminated with oil en processes. Research on the efficien	on. Chemical removal of phosphorus nulsions. Research on the rate of nitr cy of nitrogen removal in the deamm	from wastewater. Treatment of ogen and phosphorus removal unit onification process.				
Prerequisites and co-requisites	Knowledge of subjects: environment	al chemistry and biology					
Assessment methods	Subject passing criteria	Passing threshold	Percentage of the final grade				
and criteria	Final exam	60.0%	70.0%				
	Passing laboratories	60.0%	30.0%				
Recommended reading	Basic literature	. Łomotowski J., Szpindor A.: Nowoczesne systemy oczyszczania scieków. Arkady, Warszawa, 1999.2. Praca zbiorowa (red.: Dleszkiewicz J.): Poradnik eksploatatora oczyszczalni ścieków. Wyd. 2ZITS, Poznań, 1997.3. Henze M., Harremoes P., Jansen J., Arvin E.: Dczyszczanie ścieków procesy biologiczne i chemiczne. Wyd. Politechniki Świętokrzyskiej, Kielce, 2002.4. Bever J., Stein A., eichmann H.: Zaawansowane metody oczyszczania ścieków łiminacja azotu i fosforu, sedymentacja i filtracja. Wyd. Projprzem-Eko, 8ydgoszcz, 1997.					
	eResources addresses	 Magrel L.: Uzdatnianie wody i oczyszczanie ścieków. Wyd. Ekonomia i Środowisko, Białystok, 1999.2. Bernacka J., Kurbiel J., Pawłowska L.: Usuwanie związków biogennych ze ścieków miejskich. Wydawnictwo Instytutu Ochrony Środowiska, Warszawa, 1992. Adresy na platformie eNauczanie: Technologia Wody i Ścieków II. NS. 2024 - Moodle ID: 37782 					
		https://enauczanie.pg.edu.pl/moodle/course/view.php?id=37782					
Example issues/ example questions/ tasks being completed							
Work placement	Not applicable						