

Subject card

Subject name and code	Water and Wastewater Treatment Technologies - lecture, PG_00201280						
Field of study	Aquaculture – Business And Technology						
Date of commencement of studies	October 2026	Academic year of realisation of subject			2026/2027		
Education level	Bachelor's 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	1	Language of instruction			Polish		
Semester of study	2	ECTS credits			2.0		
Learning profile	practical	Assessment form			credit		
Conducting unit	Laboratory of Biochemical Analytics and Nanodiagnostics -> Department of Environmental Technology -> Faculty of Chemistry -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		prof. dr hab. Adam Lesner				
	Teachers						
Lesson types	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		1.0		19.0	50
Subject objectives	The purpose of the course is to familiarize students with the content of the lecture topics.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[AKWAL3-U06] can apply basic techniques and technological processes related to the use of elements of the environment for practical purposes	The student correctly connects theories to practice, combining unit processes into an efficient technological process,			[SU4] test/exam - oral or written		
	[AKWAL3-U02] can make observations and perform simple physical / biological / chemical measurements that are typical in socio-economic activity based on natural sciences	The student is able to operate physical and chemical apparatus, identifies basic chemical reagents, naming them correctly. He has the ability to critically interpret the results obtained.			[SU1] oral statement/conversation/discussion [SU8] observation of student's independent or team work		
	[AKWAL3-K02] is ready to take responsibility for the work of the team and its safety; knows how to make decisions and how to act in different situations	The student has the skills to perform basic laboratory experiments with laboratory safety and proper cooperation in a laboratory group.			[SK5] implementation of a problem task [SK8] observation of student's independent or team work		
	[AKWAL3_W02] has an advanced understanding of chemical, biological, physical processes and phenomena, identifies them, analyses their mechanisms in relation to the aquatic environment, and is aware of the connections between various natural disciplines	The student can, using physical, chemical or biochemical terms and phenomena, explain the course of natural phenomena occurring in the environment. He can synthetically analyze their course and effects.			[SW4] test/exam - oral or written		
[AKWAL3_W06] has an advanced understanding of techniques, research methods and tools used in aquaculture	The student describes, using the correct terminology, the unit processes and the mechanisms occurring during their course.			[SW4] test/exam - oral or written			

Subject contents	<p>LECTURE:A.1. Basic concepts of water theory in the natural environmentA.2. Physicochemical characteristics of surface and groundwater and their temporal changes (State Environmental Monitoring).A.3. Assessment of changes in surface and groundwater quality under the influence of natural and anthropogenic environmental transformationsA.4. Basic processes in water purificationA.5. Removal of specific pollutants from water (POPs, heavy metals)A.6 Environmental law in the aspect of waterLABORATORY EXERCISES:B.1. Physicochemical analyses of waterB.2. Examples of technological processes used in wastewater and water treatmentB.3. Analysis of the course of the water treatment process based on technologies used in selected treatment stations in the Pomeranian provinceFIELD EXERCISES:C.1. Seasonal changes in the quality and quantity of river outflow to the sea</p>		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	lab test	51.0%	20.0%
	written exam or PP presentationon	51.0%	80.0%
Recommended reading	Basic literature	<p>Kowal A.L., Świdorska Bróz M., 2000, Oczyszczanie wody, Wyd. Naukowe PWN, Warszawa Wrocław Surgiel P., Kurbiel J., Ćwiczenia laboratoryjne z oczyszczania wody, Politechnika Świętokrzyska, Kielce, 2001 Malina G., Szczepański A., Likwidacja zanieczyszczeń substancjami ropopochodnymi w środowisku wodno-gruntowym, Biblioteka Monitoringu Środowiska, Warszawa, 1994 Dojlido J.R., Chemia wód powierzchniowych, wyd. Ekonomia i Środowisko, Białystok, 1995 Wytyczne dotyczące jakości wody do picia. Wydanie czwarte. Izba Gospodarcza Wodociągi Polskie, Bydgoszcz 2014 (tłumaczenie języka angielskiego Wytycznych WHO z roku 2011)</p>	
	Supplementary literature	<p>Bajkiewicz Grabowska E., Mikulski Z., 2008. Hydrologia ogólna. PWN Warszawa. Niemirycz E., 2008, Halogenated organic compounds in the environment in relation to climate change, Environmental Monitoring Library, MŚ, Warszawa Żurek J., Bagiński Z., red., Prawo ochrony środowiska Wspólnoty Europejskiej, tom 7: Woda. MOŚZNiL, Warszawa, 1996</p>	
	eResources addresses		
Example issues/ example questions/ tasks being completed	<p>1. unit processes leading to the formation of excess sludge 2. Iron removal techniques 3. disinfection of water</p>		
Work placement	Not applicable		

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