

Subject card

Subject name and code	Water and wastewater treatment technologies - lectures, PG_00075892						
Field of study	Aquaculture – Business And Technology						
Date of commencement of studies	October 2025		Academic year of realisation of subject		2025/2026		
Education level	Bachelor's studies		Subject group				
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		prof. dr hab. Adam Lesner				
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		20.0		0.0	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-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-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-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_W02] knows and understands 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] knows and discusses 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	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		
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	Kowal A.L., Świdarska 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)	
	Supplementary literature	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	
	eResources addresses		
	Example issues/ example questions/ tasks being completed	1. unit processes leading to the formation of excess sludge2. Iron removal techniques3. disinfection of water	
Work placement	Not applicable		

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