University of Gdańsk

Subject card

Subject name and code	Water Treatment - lecture, PG_00201430						
Field of study	Water Management and Protection of Water Resources						
Date of commencement of studies	October 2027		Academic year of realisation of subject	2028/2029			
Education level	Bachelor's studies		Subject group	Obligatory subject group in the field of study Subject group related to practical vocational preparation			
Mode of study	full-time studies		Mode of delivery	at the university			
Year of study	2		Language of instruction	Polish			
Semester of study	3		ECTS credits	3.0			
Learning profile	practical		Assessment form	exam			
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		2.0		43.0	75
Subject objectives	To familiarize the student with all the basic processes of water treatment.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[GWOZWL3-W08] advanced knowledge and understanding of the key concepts and issues within their field of study in foreign language.	Knows and is able to use basic concepts related to the field of study in English.	[SW1] oral statement/ conversation/discussion [SW3] text preparation/written work
[GWOZWL3-W10] the system of organization of the work at the place where it is taking place and the tasks in the field of water management that are the subject of the plant's activities.	The student knows the system of organization of the work at the place where it is taking place and the tasks in the field of water management that are the subject of the plant's activities.	[SW1] oral statement/ conversation/discussion
[GWOZWL3-W09] potential threats and sources of pollution of surface and groundwater resulting from the development of civilization, in particular strong anthropopression.	The student lists and classifies in terms of origin and physicochemical propertiesand types of pollution.	[SW4] test/exam - oral or written
[GWOZWL3-W03] the organisation and legal framework of environmental protection, nature conservation and water management, as well as the principles governing the organisation and operation of hydrological and meteorological services and the fundamentals of Integrated Environmental Monitoring.	The student lists using correct terminology the principles and organizations of water protection and water monitoring	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion
[GWOZWL3-W02] the importance of advanced knowledge in the sciences allowing to understand the processes and phenomena occurring in the hydrosphere, as well as knowledge of the social sciences and of the Earth's geographic environment - as a system of interrelated and interacting components.	The student, in an appropriate manner using specialized terminology, describes natural phenomena related to the dynamics of water resources and human influence on the natural hydrological cycle	[SW4] test/exam - oral or written
[GWOZWL3-W06] issues relating to hydraulic engineering and water treatment and wastewater treatment processes.	The student describes, using the correct nomenclature, the basic unit processes, water treatment technologies and technical solutions for achieving the specified effects.	[SW4] test/exam - oral or written [SW2] presentation/project/paper/ report

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 the technologies used in selected treatment stations in the Pomeranian province

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
written exam or oral presentaion	51.0%	80.0%
lab test	51.0%	20.0%

Recommended reading

Basic literature

Kowal A.L., Świderska Bróż 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 compouds 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. removal of gaseous pollutants2 Flotation and sedimentation. Compare3 Reverse osmosis. Mechanism of action and application.	
Work placement	Not applicable	

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