

**Subject card**

<b>Subject name and code</b>	Copy Water treatment - laboratory exercises, PG_00091482						
<b>Field of study</b>	Water Management and Protection of Water Resources						
<b>Date of commencement of studies</b>	October 2024		<b>Academic year of realisation of subject</b>			2025/2026	
<b>Education level</b>	Bachelor's studies		<b>Subject group</b>			Obligatory subject group in the field of study Subject group related to scientific research in the field of study Subject group related to practical vocational preparation	
<b>Mode of study</b>	full-time studies		<b>Mode of delivery</b>			at the university	
<b>Year of study</b>	2		<b>Language of instruction</b>			Polish Polish	
<b>Semester of study</b>	3		<b>ECTS credits</b>			2.0	
<b>Learning profile</b>	practical		<b>Assessment form</b>				
<b>Conducting unit</b>	Laboratory of Biochemical Analytics and Nanodiagnostics -> Department of Environmental Technology -> Faculty of Chemistry -> Rector						
<b>Name and surname of lecturer (lecturers)</b>	<b>Subject supervisor</b>		dr Natalia Gruba				
	<b>Teachers</b>						
<b>Lesson types</b>	<b>Lesson type</b>	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	<b>Number of study hours</b>	0.0	0.0	30.0	0.0	0.0	30
	E-learning hours included: 0.0						
<b>Learning activity and number of study hours</b>	<b>Learning activity</b>	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	<b>Number of study hours</b>	30		5.0		10.0	45
<b>Subject objectives</b>	To familiarize the student with all the basic water purification processes.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[GWOZWL3-K05] take responsibility for the safety of their own work and that of others, dealing with emergencies, exercising caution in the laboratory and in the field, responsibility for entrusted equipment and apparatus	The student is ready to apply occupational health and safety regulations while conducting laboratory work.	[SK8] observation of student's independent or team work
	[GWOZWL3-U02] select and independently apply basic research techniques and tools, with adhering to established analytical procedures in the field of environmental research in water management, adequately to the considered research problem	The student is able to select and independently apply basic water analysis techniques, in accordance with established procedures, appropriate to the research problem being considered.	[SU8] observation of student's independent or team work
	[GWOZWL3-U01] make basic observations of processes and phenomena occurring in the hydrosphere and carry out basic measurements of selected processes of water purification on a laboratory scale	The student is able to perform basic observations and measurements of selected water purification processes on a laboratory scale.	[SU6] demonstration of practical skills [SU8] observation of student's independent or team work
Subject contents	Basic activities in laboratory work. Exercises simulating sample technological processes used to purify water and post-industrial waste.		
Prerequisites and co-requisites	None		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Research report	51.0%	20.0%
	Student's own work	51.0%	20.0%
	Test	51.0%	60.0%
Recommended reading	Basic literature	<p>Kowal A.L., Świdorska Bróz M., 2000, Water purification, PWN Scientific Publishing House, Warsaw Wrocław</p> <p>Surgiel P., Kurbiel J., Laboratory exercises in water purification, Kielce University of Technology, Kielce, 2001</p> <p>Malina G., Szczepański A., Elimination of pollution with petroleum derivatives in the water and ground environment, Environmental Monitoring Library, Warsaw, 1994</p> <p>Dojlido J.R., Surface water chemistry, Ekonomia i Środowisko Publishing House, Białystok, 1995</p> <p>Guidelines for the quality of drinking water. Fourth edition. Polish Waterworks Chamber of Commerce, Bydgoszcz 2014 (English translation of the WHO Guidelines from 2011).</p>	
	Supplementary literature	<p>Niemirycz E., 2008, Halogenated organic compounds in the environment in relation to climate change, Environmental Monitoring Library, MŚ, Warsaw</p> <p>Żurek J., Bagiński Z., eds., Environmental Protection Law of the European Community, volume 7: Water. MOŚZNiL, Warsaw, 1996</p>	
	eResources addresses		
Example issues/ example questions/ tasks being completed	-		
Work placement	Not applicable		

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