



## Subject card

Subject name and code	Environmental Chemistry [E], PG_00042497						
Field of study	Environmental Engineering						
Date of commencement of studies	October 2021	Academic year of realisation of subject			2021/2022		
Education level	second-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	1	Language of instruction			Polish		
Semester of study	1	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 inż. Karolina Fitobór				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	15.0	0.0	0.0	0.0	30
	E-learning hours included: 0.0						
	Chemia Środowiska (wykład) - 2021/2022 - Moodle ID: 14600 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=14600">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=14600</a>						
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		5.0		65.0	100
Subject objectives	The o familiarizing of the student with the natural processes and chemical composition of the spheres of the universe due to anthropopressure.						
Learning outcomes	Course outcome		Subject outcome			Method of verification	
	[K7_U01] can obtain information from literature, databases and other sources; can integrate the obtained information, interpret and critically evaluate them, draw conclusions, and formulate and comprehesively justify the opinions		The student is able to obtain the necessary information as well as draw conclusions and formulate and fully justify opinions			[SU3] Assessment of ability to use knowledge gained from the subject	
[K7_W03] has in-depth, structured and theoretical knowledge related to the environmental chemistry, environmental management and monitoring, or the technology and organization of installation works or measurements in environmental engineering		The student has knowledge related to environmental chemistry, environmental management and monitoring;			[SW1] Assessment of factual knowledge		
Subject contents	The rise of the Universe, the Doppler effect. Absorption spectra. Residual radiation. Elementary particles. The creation of the Solar System and Earth. Thermonuclear reactions. Earth's lithosphere. Construction of the lithosphere. The role and importance of humic substances in the environment. The distribution of water on Earth. Characteristics of the World Ocean. Comparison of the chemical composition of sea water, rainwater and fresh water. Human impact on surface water pollution. The qualitative composition of rainwater sewage. The qualitative composition of leachate from municipal landfills. The division and composition of sewage and waste generated in the integrated sanitary system. Atmosphere of the Earth. Construction and composition of the Earth's atmosphere. The role and importance of the Earth's atmosphere. Atmospheric pollution. Changes of pollutants in the atmosphere.						
Prerequisites and co-requisites	Knowledge of the subject: Chemistry						
Assessment methods and criteria	Subject passing criteria		Passing threshold			Percentage of the final grade	
	written exam		50.0%			60.0%	
	passing the exercises		50.0%			40.0%	

Recommended reading	Basic literature	[1] Andrews J. E., Brimblecombe P., Jickells T. D., Liss P. S.: Wprowadzenie do chemii środowiska. Warszawa: WNT. [2] O'Neill P.: Chemia środowiska. Warszawa: WN PWN., [3] . Hillel D. Gleba w środowisku. Wyd. Naukowe PWN, Warszawa, 2012, [4] vanLoon G.W., Duffy S.J., Chemia środowiska. PWN, Warszawa 2007, [5] Naumczyk J. Chemia ŚrodowiskaWydawnictwo Naukowe PWN SA, Warszawa 2017
	Supplementary literature	[1] Hermanowicz W.: Chemia sanitarna. Warszawa: PWN., [2]. Zieliński S. Skażenie chemiczne w środowisku, Oficyna Wydawnicza Politechniki Wrocławskiej, Wrocław 2007
	eResources addresses	
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	