



Subject card

Subject name and code	Environmental Chemistry, PG_00037386						
Field of study	Chemistry						
Date of commencement of studies	October 2020		Academic year of realisation of subject		2022/2023		
Education level	first-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	Full-time studies		Mode of delivery		at the university		
Year of study	3		Language of instruction		Polish		
Semester of study	6		ECTS credits		5.0		
Learning profile	general academic profile		Assessment form		exam		
Conducting unit	Department of Analytical Chemistry -> Faculty of Chemistry						
Name and surname of lecturer (lecturers)	Subject supervisor		prof. dr hab. inż. Bożena Zabiegała				
	Teachers		prof. dr hab. inż. Bożena Zabiegała dr hab. inż. Mariusz Marć prof. dr hab. inż. Andrzej Wasik dr inż. Małgorzata Rutkowska prof. dr hab. inż. Agata Kot-Wasik				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	60.0	0.0	0.0	90
	E-learning hours included: 0.0						
	Address on the e-learning platform: https://enauczanie.pg.edu.pl/moodle/course/view.php?id=18122						
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	90		5.0		30.0	125
Subject objectives	Understanding of the basic processes taking place in the various elements of the environment (atmosphere, hydrosphere and geosphere. Analysis of interaction between the elements of the environment. Assess the human activities on the environment, define environmental imbalance risks. Explaining of environmental changes and phenomena arising from the civilization development discussion of pollution levels of individual ecosystems, analysis of the possibilities of protecting ecosystems from pollution.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_U01] knows how to get information from literature, databases and other sources, can integrate the information obtained, interpret and critically evaluate it, and draw conclusions, and to formulate and justify the opinions	The student can independently design, perform simple experiments to determine the concentration level of selected pollutants present in the environment. The student can interpret the results obtained and assess the environmental pollution level on the basis of them results.	[SU3] Assessment of ability to use knowledge gained from the subject
	[K6_K02] is aware of the importance of the beyond-technical aspects and effects of engineering activities, including its environmental impact and the associated responsibility for the decisions made	The student understands the need to promote the principles of environmental protection The student can pass the knowledge on the principles of safe and proper handling of chemicals to minimize their environmental impact. Understands the need to learn and communicate their knowledge about the environment to others in order to contribute to promoting eco-friendly behaviour.	[SK5] Assessment of ability to solve problems that arise in practice [SK1] Assessment of group work skills
	K6_W02	The student understands and is able to describe the processes taking place in the environment. Can assess the impact of anthropogenic human activity on the environment	[SW1] Assessment of factual knowledge
Subject contents	<p>Lecture:</p> <p>Learn about basic definitions and environmental learning considerations. Description of environmental-related phenomena</p> <p>Litosphere - Chemical contamination and contamination of soils. Pesticides (breakdown and general toxicological characteristics, adsorption and degradation).</p> <p>Atmosphere - composition and structure (cyclical and acyclic changes). Sources of atmospheric pollution and self-regulation mechanisms. Aerosols and smogs. Greenhouse effect. Ozone in the atmosphere. Acid rain (effects on the natural environment). Energy balance of the earth. Impact of atmospheric pollution on a global, continental and local scale</p> <p>Hydrosphere - characteristics and classification. Chemical water pollution. Detergents. Eutrophication. The problem of the Baltic Sea. Water pollution indicators. Characteristics of water self-cleaning processes.</p> <p>Laboratory exercises (1) sampling for analysis of the environmental samples; (2) Qualitative and quantitative analysis of organic and inorganic pollutants present in the water samples taken (e.g. precipitation, run-off waters), soil and air samples; (3) The use of analytical chemistry in environmental protection; (4) Get acquainted with the use of fast tests in the analytics environment).</p>		
Prerequisites and co-requisites	The student should have knowledge of general, physical and analytical chemistry. Knowledge of basic rules and chemical rights, basic activities and techniques of laboratory work. The student should also have the knowledge necessary to understand the essence of the basic physico-chemical changes taking place in the environment.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
		60.0%	60.0%
		60.0%	40.0%
Recommended reading	Basic literature	The Handbook of Environmental Chemistry Editors-in-Chief: Damia Barcelo I Andrey G. Kostianoy, ISSN 1433-6863 c©2009 Springer-Verlag Berlin Heidelberg, DOI 10.1007/978-3-540-88014	
	Supplementary literature	An Introduction to Environmental Chemistry SECOND EDITION J.E. Andrews, P. Brimblecombe, T.D. Jickells, P.S. Liss and B. Reid School of Environmental Sciences University of East Anglia United Kingdom	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	<ol style="list-style-type: none">Thosphoters ozone, mechanism of formation and environmental impactAlbedo definition, impact on the energy balance of the EarthPrimary aerosol and secondary aerazolmicrobiological air pollutionhydroxyl radical		
Work placement	Not applicable		