

Subject card

Subject name and code	Marine and atmospheric chemistry - lecture, PG_00157804						
Field of study	Oceanography						
Date of commencement of studies	October 2025		Academic year of realisation of subject			2026/2027	
Education level	Bachelor's studies		Subject group			Obligatory subject group in the field of study	
Mode of study	full-time studies		Mode of delivery			at the university	
Year of study	2		Language of instruction			Polish	
Semester of study	4		ECTS credits			2.0	
Learning profile	academic		Assessment form			exam	
Conducting unit	Laboratory of the Biogeochemical Cycle of Elements -> Department of Chemical Oceanography and Marine Geology -> Faculty of Oceanography and Geography -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		prof. dr hab. Magdalena Beldowska				
	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		5.0		20.0	55
Subject objectives	• Presentation of selected problems in the field of marine and atmospheric chemistry, in relation to selected natural and anthropogenic components. • Familiarization with chemical phenomena and processes in sea water and the Earth's atmosphere. • Understanding the functioning of the Earth Atmosphere system.						
Learning outcomes	Course outcome		Subject outcome			Method of verification	
	OCEANL3-W06		Knows and understands the basic chemical processes and phenomena occurring in the sea and atmosphere Understands the problem of sustainable management of the marine environment and the consequences of disturbing the balance in the marine ecosystem and atmosphere resulting from anthropopressure.			[SW4] test/exam - oral or written	
	OCEANL3-W02		Knows and understands a wide range of processes affecting the exchange streams of chemical substances at the atmosphere-water interface. Understands the processes influencing the variability of chemical concentrations in seawater and the atmosphere.			[SW4] test/exam - oral or written	

Subject contents	1. Chemical composition and structure of the atmosphere, chemical and photochemical reactions occurring in individual layers of the atmosphere; 2. Earth's heat balance and radiation budget in the Earth-Atmosphere system; 3. Natural and anthropogenic atmospheric pollutants - sources of their origin, transformations, removal processes from the atmosphere, their impact on the land and marine environment, climate and human health; 4. Trace elements in seawater; 5. Horizontal and vertical transport of elements in seawater, including the role of the sea surface microlayer in the exchange of elements between the sea and the atmosphere		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	atmospheric chemistry exam	51.0%	50.0%
	marine chemistry exam	51.0%	50.0%
Recommended reading	Basic literature	- Falkowska L., 1996, Sea surface microlayer: properties and processes. University of Gdańsk Publishing House, Gdańsk -183; - Falkowska L., A. Lewandowska, Aerosols and gases in the atmosphere - global changes, 2009. Publishing House of the University of Gdańsk, Gdańsk, - 505; - Stepnowski P., Synak E., Szafranek B., Kaczyński Z., 2010, Monitoring and analysis of environmental pollution, UG Publishing House, ISBN 978-83- 7326-712-1, -283.	
	Supplementary literature	- Juda-Rezler K., 2006, Impact of air pollution on the environment, Publishing House of the Warsaw University of Technology, Warsaw; - Sainfeld J.H., Pandis S.N., 2016, Atmospheric Chemistry and Physics: From Air Pollution to Climate Change, 3rd Edition. John Wiley & Sons, Inc., New York, Chichester, Weinheim, Brisbane, Singapore, Toronto, -1152; - Baltic Sea Environment Proceedings No 120B, 2010, Hazardous substances in the Baltic Sea, Helsinki Commission	
	eResources addresses		
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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