University of Gdańsk

Subject card

Subject name and code	Marine and Atmospheric Chemistry - lecture, PG_00205314		
Field of study	Oceanography		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2027/2028
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 Bełdowska	
	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

Additional information:

Lecture with multimedia presentation.

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	18.0	50

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] has an advanced understanding of the principles of managing the marine environment and its resources, as well as the consequences of disrupting the balance of marine ecosystems	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] has a broad knowledge and understanding of physical, biological, chemical, and geological processes and phenomena occurring in aquatic environments, with particular emphasis on the marine environment	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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