University of Gdańsk

Subject card

Subject name and code	Aerosols and gases in the atmosphere - lecture, PG_00054991		
Field of study	Oceanography		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2024/2025
Education level	postgraduate 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	1	Language of instruction	Polish polish
Semester of study	1	ECTS credits	2.0
Learning profile	academic	Assessment form	
Conducting unit	Pracownia Biogeochemicznego Obiegu Pierwiastków -> Katedra Oceanografii Chemicznej i Geologii Morza -> Faculty of Oceanography and Geography		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. Anita Lewandowska	
	Teachers	dr hab. Anita Lewandowska	

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	0.0	0.0	0.0	15

E-learning hours included: 0.0

Additional information:
lecture

classes in the classroom

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	15	15.0	25.0	55

Subject objectives

Discussion of the evolution of the chemical composition of air under the influence of the processes of interaction of the ocean, land, biosphere (man) with the atmosphere. Identification of current problems related to atmospheric pollution with aerosols and gases.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[OCEANMU2-W06] knows and identifies potential threats to the marine environment on a local and global scale resulting from strong anthropopressure, predicts their effects on various time and space scales	knows and identifies potential threats to the marine environment resulting from strong anthropopressure of the atmosphere in coastal areas of seas and oceans and predicts their effects on various time and space scales	[SW4] test/exam - oral or written
[OCEANMU2-W02] knows and understands complex processes and phenomena occurring in the marine environment, with particular emphasis on the coastal zone, as well as complex relationships between living and non-living elements of the aquatic environment	knows and understands in greater detail the complex relationships between the ocean, land, biosphere (man) and the atmosphere, identifies and correctly describes complex phenomena occurring in the atmosphere with the participation of aerosols and gases and explains their course in relation to processes occurring in the aquatic environment, with particular emphasis on marine environment and coastal zone	[SW4] test/exam - oral or written

Subject contents

1. Evolution of the atmosphere.
2. Interactions between gases, aerosols, water vapor and clouds.
3. Atmospheric deposition.
4. Photochemical and microbiological transformations of nitrogen, carbon, sulfur and phosphorus compounds.
5. Hazardous substances (metals and their organic derivatives). Pollution allocation.
6. The role of atmospheric chemistry in shaping Earth's climate change - controlling the amount and distribution of natural and anthropogenic atmospheric components.
7. Aerosols and gases responsible for warming and cooling the climate.
8. Feedback, i.e. the impact of climate on chemical and physical processes, and thus on the composition of the atmosphere. Direct and indirect aerosol effects.
9. Consequences of global changes on land and marine ecosystems.
10. The impact of epidemic situations and related restrictions on air quality.

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
written exam with open questions	51.0%	100.0%

Recommended reading

Basic literature

1. Falkowska L., Sea surface microlayer: properties and processes. UG Publishing House, Gdańsk, 1996.
2. Falkowska L., A. Lewandowska, Aerosols and gases in the atmosphere - global changes, University of Gdańsk Publishing House, Gdańsk, 2009
3. Stepnowski P., Synak E., Szafranek B., Kaczyński Z, Monitoring and analysis of environmental pollution, UG Publishing House, 2010
4. Collective work edited by Józef Kuropka, Kazimierz Gaj and Izabela Sówka, Current problems in engineering and atmospheric protection, Oficyna Wydawnicza Politechniki Wrocławskiej, Wrocław 2018.
5. Teamwork edited by Katarzyna Judy-Rezler and Barbara Toczko, Fine dust in the atmosphere. Compendium of knowledge about air pollution with suspended dust in Poland, Environmental Monitoring Library, Warsaw, 2016

	Supplementary literature	1. Juda-Rezler K., Impact of air pollution on the environment, Publishing House of the Warsaw University of Technology, Warsaw, 2006, 2. Liss P.S., Johnson M.T., Ocean-Atmosphere Interactions of Gases and Particles, Springer Earth System Sciences, 2014 3. Sainfeld J.H., Pandis S.N., Atmospheric Chemistry and Physics: From Air Pollution to Climate Change, 3rd Edition. John Wiley & Sons, Inc., New York, Chichester, Weinheim, Brisbane, Singapore, Toronto, 2016
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	

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