

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 2025		Academic year of realisation of subject		2025/2026		
Education level	Master's studies		Subject group		Obligatory subject group in the field of study Optional subject group 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	1		Language of instruction		Polish		
Semester of study	1		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		dr hab. Anita Lewandowska				
	Teachers						
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						
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. Origin of aerosols and gases in the atmosphere. 2. Size distribution and lifetime of aerosols. 3. Processes of removing aerosols and gases from the atmosphere. 4. The role of aerosols and gases in shaping the climate and its change. 5. The impact of aerosols and gases on human health. 6. The impact of air quality on the incidence of COVID-19 and other viral and bacterial diseases in the world. 7. The impact of restrictions introduced in connection with COVID-19 on the state of air quality. 8. The impact of synoptic conditions on the degree of air pollution with aerosols and gases. 9. Natural environmental factors shaping air quality in the coastal zone of the sea, with particular emphasis on the southern Baltic Sea 10. Local, regional and distant sources of anthropogenic pollution in the atmosphere of the urbanized coastal zone of the southern Baltic Sea. 11. European and global legal regulations aimed at reducing poor air quality in terms of its pollution with aerosols and gases		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	oral or 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 Kuroпка, 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		
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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