University of Gdańsk

Subject card

Subject name and code	Chemistry of Suspended Particulate Matter - lecture, PG_00205349		
Field of study	Oceanography		
Date of commencement of studies	October 2027	Academic year of realisation of subject	2029/2030
Education level	Bachelor'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	3	Language of instruction	Polish
Semester of study	6	ECTS credits	1.0
Learning profile	academic	Assessment form	credit
Conducting unit	Laboratory of Marine Environmental Protection -> Department of Chemical Oceanography and Marine Geology -> Faculty of Oceanography and Geography -> Rector		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. Dorota Burska, prof. UG	
	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	1.0	9.0	25

Subject objectives

Presentation of the processes determining the concentration and chemical composition of suspensions in the marine environment and the role of particles in controlling the reactivity, transport and biological impacts of chemicals in this environment.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[OCEANL3-W01] has an advanced knowledge and understanding of the terminology used in oceanography and related exact and natural sciences (in Polish and a selected foreign language)	Knows and understands the terminology in the field to an advanced degree chemistry of suspensions in aqueous environments, especially marine ones, in Polish and English	[SW4] test/exam - oral or written
[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	Identifies threats related to anthropopressure, related to chemical composition of suspensions, their transport, reactivity and bioavailability and understands the consequences of disturbing the balance of marine ecosystems	[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	Describes the basic processes that determine the quantity and quality of suspensions in the seas and oceans. Understands the role of suspensions as a key link in circulation chemical elements and relationships between the water column, sediment and atmosphere and the food chain	[SW4] test/exam - oral or written

Subject contents

1. Basic concepts and definitions regarding suspensions in the aquatic environment.2. The main components of the circulation of suspension in water and the processes that particles undergo in the aquatic environment.3. Interactions at the water-suspension interface. Competitiveness of sorption and complexation processes.4. Suspended organic matter, its basic chemical composition (C, O, H, N, P, S) and biochemical composition. Degradation of organic matter, reactivity of matter, toxicity of degradation products. 5. Spatial and temporal changes in the chemical composition of suspensions in seas and oceans. Layers of increased suspension concentration in the water column and chemical characteristics of particles in these layers. Streams of suspended solids and their components in the marine environment.6. Enrichment of marine suspensions with substances of anthropogenic origin: e.g. metals, organometallic compounds, persistent organic pollutants, plastics. The influence of the presence of soot particles in marine suspension on the sorption of hazardous substances.

Prerequisites and co-requisites

Ability to use any spreadsheet; knowledge of English at an intermediate level

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Test	51.0%	100.0%

Recommended reading

Basic literature

1. Burska D., Graca B., 2011. Biogenic substances in suspension. In: Uścinowicz Sz., (ed.), Geochemistry of Baltic Sea surface sediments, Ed. Polish Geological Institute-National Research Institute, Warsaw

2.Dojlido J., 1995. Chemistry of surface waters, Ed. Economics and Environment, Białystok (in Polish)

3. Pempkowiak J., 1997. Outline of marine geochemistry, Ed. University of Gdańsk, Gdańsk (in Polish)

	Supplementary literature	1.Musielak S., 1985.Sediments of seas and oceans, University scripts, University of Gdańsk (in Polish). 2. Burska D., Szymczak E., Pryputniewicz-Flis D.2022: Suspension in the waters of the Bay of Puck, In: Zatoka Puck, vol. 2, Aspects chemical / Bolałek J., Burska D. (ed.), Gdańsk University Press, pp. 76-94, (in Polish). 3.Burska D., Szymczak E., 2018, Suspension in the waters of the Vistula Lagoon. [in] The Vistula Lagoon J.Bolałek (red.), PWN, 115-129; warsaw (in Polish). 4.science publications(np. Walch H., Kammer F., Hofmann T.,2022, Freshwater suspended particulate matterKey components and processes in floc formation and dynamics Water Research, V, 15, 118655); scientific reports (np.: UNEP Report 2021).
	eResources addresses	
Example issues/ example questions/ tasks being completed	1.Give a definition of Langmuir adsorption isotherms; 2.Draw a vertical profile of POC concentration (including the range of unit concentrations, and depth) in the waters of the Gulf of Gdansk and indicate the processes determining such a course; 3.The average content of elements building organic matter equals 50%; 29.4%; 8.6%; 5.7% - give the elements corresponding to the given % content. 4 Indicate the most important steps in the degradation of organic matter and give the most important products of this process. 5.Indicate the most important natural sorbents present in natural waters. 6.Define the role of suspended solids in the self-purification of water bodies.	
Work placement	Not applicable	

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