University of Gdańsk

Subject card

Subject name and code	Chemistry of the Bottom Sediments - lecture, PG_00205334		
Field of study	Oceanography		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2028/2029
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	5	ECTS credits	2.0
Learning profile	academic	Assessment form	exam
Conducting unit	Department of Chemical Oceanography and Marine Geology -> Faculty of Oceanography and Geography -> Rector		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. Bożena Graca, prof. UG	
	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	2.0	18.0	50

Subject objectives

The aim of the course is to familiarise students with the basic issues related to sediment chemistry. Information on the importance of bottom sediments in the ecosystem and the factors and processes shaping their chemical composition are presented. Methods of collecting and examining the chemical composition of sediments and interstitial waters and estimating the rate of biogeochemical processes within the sediment are discussed.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[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 basic natural phenomena and explains their course about geological processes	[SW4] test/exam - oral or written
[OCEANL3-W05] has an advanced knowledge of techniques, research methods, and tools (mathematical, statistical, and computational) used by oceanographers to describe and interpret processes and phenomena occurring in the marine environment	knows and understands the terminology relevant to biogeochemical studies of bottom sediments	[SW4] test/exam - oral or written

<table>
<tr><td>Subject contents</td><td>A. Problems of the lecture
A1.The importance of bottom sediments in the aquatic environment.
A2. Natural (biotic and abiotic) and anthropogenic factors (chemical pollution supply, bottom trawling, dredging) shaping chemical properties of bottom sediments.
A3.Circulation cycle of elements in the water-sediment contact zone using nutrient elements as an example.
A4.Use of stable isotopes and radioisotopes in the study of bottom sediments.
A5. Methods of sediment sampling their preservation and storage in chemical studies.
A6. Sequential analyses in sediment chemical composition studies using phosphorus as an example.
A7. Interstitial waters - methods of recovery, chemical composition, factors shaping variability.
A8. Disproportionation of organic matter, effect on pH, Eh, alkalinity, gas formation in sediments.

A9 Clay minerals - reverse weathering
A10. Use of sediment incubation to study biogeochemical processes in sediments (exchange of elements in the water-sediment contact zone, rates of denitrification and nitrification).</td></tr>
<tr><td>Prerequisites and co-requisites</td><td></td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>exam</td><td>51.0%</td><td>100.0%</td></tr>
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<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>Schulz i Zabel 2000 (red.), Marine Geochemistry. Springer-Verlag Berlin-Heidelberg
Starmach, K., Wróbel, S., i Pasternak, K., (red.), Hydrobiologia. Państwowe Wydawnictwo Naukowe, Warszawa
E.M. Emelyanov (red.), 2002, Geology of the Gdańsk Basin, Baltic Sea. Russian Academy of Sciences, Yantarny skaz, Kaliningrad
Libes, S.M., 1992. An introduction to marine biogeochemistry. Wiley and Sons, New York, 743 s.
Wulff, F., Rahm, L.A. i Larsson, I.P., (red.), 2001, A systems analysis of the Baltic Sea
Czasopisma naukowe</td></tr>
<tr><td>Supplementary literature</td><td>Wybrane artykuły naukowe z zakresu chemii osadów dennych

Graca, B., 2009, Dynamika przemian azotu i fosforu w strefie kontaktu wody z osadem dennym w Zatoce Gdańskiej, Wy-dawnictwo Uniwersytetu Gdańskiego</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
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</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>The role of sediments in shaping the chemical composition of other Earth spheres

Experimental methods in the study of bottom sediment</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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