University of Gdańsk

Subject card

Subject name and code	Emission of Nutrients from Polish Agriculture to The Baltic Sea - discussion classes, PG_00201530		
Field of study	Water Management and Protection of Water Resources		
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
Mode of study	full-time studies	Mode of delivery	at the university
Year of study	3	Language of instruction	English
Semester of study	6	ECTS credits	2.0
Learning profile	practical	Assessment form	credit
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. Katarzyna Łukawska-Matuszewska	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	20.0	0.0	0.0	0.0	0.0	20

E-learning hours included: 0.0

Additional information:

- Text analysis with discussion
- Multimedia presentation
- Data analysis

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	20	1.0	29.0	50

Subject objectives

To gain knowledge about the sources of pollution in the marine environment and their impact on the eutrophication of the Baltic Sea. To learn the basic concepts and terms of water protection. To learn about natural and anthropogenic factors shaping the concentration of nutrients in the Baltic Sea. Cycling of N and P in the marine environment.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[GWOZWL3-U15] The student by solving in groups the assigned problem situations, is able to appropriately set priorities to achieve task defined by themselves or others.	Is able to work in a group, set priorities and appropriately plan the activities necessary to complete the task	[SU5] implementation of a problem task [SU8] observation of student's independent or team work
[GWOZWL3-W09] The student knows and understands potential threats and sources of pollution of surface and groundwater resulting from the development of civilization, in particular strong anthropopression.	Knows the potential threats to the environment and the sources of marine water pollution	[SW1] oral statement/ conversation/discussion [SW2] presentation/project/paper/ report
[GWOZWL3-U13] The student is able to read with understanding specialized scientific texts in Polish and foreign language.	Is able to read with understanding scientific publications on anthropopression, including marine inflows and eutrophication in English	[SU1] oral statement/conversation/ discussion [SU3] text preparation/written work
[GWOZWL3-U12] The student can formulate opinions on a selected topic and prepare small studies in foreign language.	I able to formulate opinions on the inflow of pollutants into the sea and the eutrophication of the marine environment and to create small studies in English	[SU1] oral statement/conversation/ discussion [SU2] presentation/project/paper/ report [SU3] text preparation/written work
[GWOZWL3-W08] The student has an advanced knowledge and understanding of the key concepts and issues within their field of study in English.	Knows basic concepts related to anthropopressure, including marine inputs and eutrophication in English	[SW1] oral statement/ conversation/discussion [SW2] presentation/project/paper/ report [SW3] text preparation/written work
[GWOZWL3-W02] The student knows and understands the importance of advanced knowledge in the sciences allowing to understand the processes and phenomena occurring in the hydrosphere, as well as knowledge of the social sciences and of the Earth's geographic environment - as a a system of interrelated and interacting components.	Knows the importance of scientific knowledge to understand the processes and phenomena that cause pollution marine waters	[SW2] presentation/project/paper/ report [SW3] text preparation/written work
[GWOZWL3-U14] The student is able to speak a foreign language at the level of B2 of the Common European Framework of Reference for Languages.	The student is able to speak a foreign language at the level of B2 of the Common European Framework of Reference for Languages.	[SU1] oral statement/conversation/ discussion

Subject contents

1. Characteristics of the Baltic Sea catchment area.
2. Classification of nitrogen and phosphorus sources in the marine environment.
3. Nitrogen and phosphorus emissions from agricultural sources and inflow with river waters.
4. Nutrient emissions from the territory of Poland in comparison with other countries in the Baltic Sea catchment area.
5. Nutrient inflow from external sources vs. the ecological state of the Baltic Sea.
6. Eutrophication of the Baltic Sea - status and trends.
7. Cycle of N and P in the marine environment.

Prerequisites and co-requisites

Basic knowledge of English

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Class assignments (reading, analysis of data)	51.0%	30.0%
Final project (presentation)	51.0%	40.0%
Activity - participation in the discussion	51.0%	30.0%

Recommended reading

Basic literature	Pastuszak M. i Igras J., 2012. Temporal and spatial differences in emission of nitrogen and phosphorus from Polish territory to the Baltic Sea. Gdynia-Puławy 2012 HELCOM reports available on the websites of Helsinki Commission, Baltic Marine Environment Protection Commission (https://helcom.fi/)

	Supplementary literature	Wåhlström, I. *et al.* (2020) Combined climate change and nutrient load impacts on future habitats and eutrophication indicators in a eutrophic coastal sea. *Limnol. Oceanogr.* **65**, 21702187. https://doi.org/10.1002/lno.11446. Murray CJ, Müller-Karulis B, Carstensen J, Conley DJ, Gustafsson BG and Andersen JH (2019) Past, Present and Future Eutrophication Status of the Baltic Sea. *Front. Mar. Sci.* 6:2. doi: 10.3389/fmars.2019.00002
	eResources addresses	
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	

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