University of Gdańsk

Subject card

Subject name and code	Metals in the Marine Environment - laboratory , PG_00204981		
Field of study	Oceanography		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2027/2028
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	2	Language of instruction	Polish
Semester of study	3	ECTS credits	2.0
Learning profile	academic	Assessment form	credit
Conducting unit	Laboratory of Toxic Substances Transformation -> Department of Chemical Oceanography and Marine Geology -> Faculty of Oceanography and Geography -> Rector		
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. Magdalena Bełdowska	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	0.0	0.0	30.0	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	Practical familiarisation with the analysis of metals in various components of the marine environment.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[OCEANMU2-K01] is ready to plan, implement and supervise, individually or collectively, next stages of the entrusted task, is ready to take responsibility for its results;	be able to pose a research problem and use appropriate tools to verify it	[SK5] implementation of a problem task
[OCEANMU2-U05] is able to use source information in Polish and a chosen foreign language, including archival and electronic databases, within the field of oceanography; critically analyzes and synthesizes information, and is capable of performing critical interpretation and synthesis of data	be able to interpret the results obtained from chemical analyses	[SU2] presentation/project/paper/ report
[OCEANMU2-U03] can plan and carry out independently advanced research and measurements, both in field and laboratory, using appropriately selected measurement and analytical techniques in the field of oceanography, adequately to the studied specialty and research problem	know how to: prepare a scientific research project, take samples in the field and analyse them in the laboratory	[SU5] implementation of a problem task
[OCEANMU2-W05] knows and understands the principles of planning and conducting field and laboratory research as well as advanced methods and tools of scientific research, especially in the field of the studied specialty	know how to prepare the laboratory and the equipment for collecting study material	[SW2] presentation/project/paper/ report
[OCEANMU2-U11] is able to work individually and cooperate in laboratory and field groups, performs various functions in them, including managerial ones, performs various assigned tasks	is able to work in a group in a variety of roles	[SU5] implementation of a problem task
[OCEANMU2-K06] is prepared to think and act in an entrepreneurial manner, and, based on their qualifications, to engage in the preparation or execution of professional tasks, as well as to initiate and carry out innovative activities	knows how to ask and answer a scientific question based on the collection of samples and their chemical analysis	[SK5] implementation of a problem task

Subject contents

1. Sampling for metal analysis
2. Preparation of solid samples for metal analysis
3. Analysis of metals using atomic absorption spectroscopy
4. Metal speciation
5. Preparation and implementation of own project on metals in the marine environment

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
implementation of project task II	51.0%	20.0%
implementation of project task I	51.0%	20.0%
performing an experiment in the laboratory	51.0%	20.0%
writing and implementing a scientific research project	51.0%	40.0%

Recommended reading

Basic literature	Alina Kabata- Pendias, Arun B. Mukherjee. Trace Elements from Soil to Human, 2007
Supplementary literature	Selected scientific articles on metals in the marine environment
eResources addresses	

Example issues/ example questions/ tasks being completed	1. Does a marina affect metal concentrations in the marine environment? 2. Macroalgae as a bioindicator of metals in the Gulf of Gdansk. 3. What does mercury speciation depend on? 4. Preparation and implementation of a scientific research project on metals in the marine environment. Working in groups of 2-3 persons.
Work placement	Not applicable

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