University of Gdańsk

Subject card

Subject name and code	The Basics of Chemical Oceanography - laboratory , PG_00206155						
Field of study	Oceanography						
Date of commencement of studies	October 2027		Academic year of realisation of subject	2028/2029			
Education level	Bachelor's studies		Subject group	Obligatory subject group in the field of study 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	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, prof. UG				
	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	To learn methods for determining nutrients in seawater. Developing the ability to plan and carry out analytical work and interpreting the results based on the knowledge gained in class and the literature. To learn about the interrelationships between physical, biological and chemical processes in the sea.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[OCEANL3-K05] is willing to take responsibility for the safety of his/ her own and others' work, is aware of the risks and threats resulting from the work performed	Is willing to take responsibility for the safety of one's own work and that of others in the chemical laboratory, is aware of the risks and hazards of the work performed in the chemical laboratory	[SK2] presentation/project/paper/ report
[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 chemical processes occurring in the marine environment	[SW4] test/exam - oral or written [SW2] presentation/project/paper/ report [SW3] text preparation/written work
[OCEANL3-K01] is willing to plan and implement, individually or as a team, the subsequent stages of the entrusted task, is willing to take responsibility for the results of these works, effectively cooperates in the team and performs various roles in it	Is willing to be responsible for own work in the chemistry laboratory, to conform to the rules of teamwork, and to be responsible for the tasks performed in the team	[SK3] text preparation/written work [SK5] implementation of a problem task
[OCEANL3-U04] is able to independently search for information in Polish and foreign specialist literature, as well as on the Internet and in databases	Is able to search for information in the literature on chemical oceanography in Polish and English, as well as on the Internet and in databases	[SU2] presentation/project/paper/ report [SU3] text preparation/written work
[OCEANL3-U11] is able to work individually and collaborate in a team, assuming various roles and performing different tasks	Is able to work independently and in a laboratory group, is able to perform various tasks and functions in a group	[SU2] presentation/project/paper/ report

Subject contents

- Methods of sampling and preservation of seawater samples for chemical analysis;
- Spectrophotometric methods in the analysis of nutrients (Lambert Beer's law, calibration methods - point calibration, linear calibration);
- Performance of calibration based on chemical standards and determination of nutrients in seawater samples in the coastal zone of the Gulf of Gdańsk;
- Analysis of obtained results using statistical and graphical methods, error analysis, synthetic presentation of results in the form of a report, comparison with data available on Internet data portals (monitoring data and cruise reports of IMGW, hydrodynamic model, SatBaltic system);
- Analysis and discussion of the obtained results, taking into account the factors affecting the variability of a parameter in the marine environment;
- Independent organization of the workplace, selection of analytical procedures for conducting analyses of nutrients in seawater;
- Variability of concentration and cycling of nutrients in the marine environment.

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Presenation	51.0%	15.0%
Test	51.0%	15.0%
Entry tests	51.0%	40.0%
Reports	51.0%	30.0%

Recommended reading

Basic literature	Falkowska L., Bolałek J., Łysiak-Pastuszak E., 1999, Analiza chemiczna wody morskiej, cz. 2., Wyd.UG, Gdansk (In Polish) Bolałek J., Falkowska L., 1999, Analiza chemiczna wody morskiej, cz. 1., Wyd. UG, Gdańsk (In Polish) Korzeniewski K., 1995, Podstawy oceanografii chemicznej, Wyd. UG, Gdańsk (In Polish)
Supplementary literature	Horne R.A., 1969, Marine chemistry, Wiley, New York Riley J.P.., Chester R., 1971, Introduction to marine chemistry, Academic Press, London Riley J.P., Skirrow G., 1975, Chemical oceanography, Wyd. Academic Press, London Millero F.J., 2002. Chemical Oceanography 2nd ed. CRC Press, Boca Raton, Boston, London, New York, Washington, DC, 490. Stumm W., Morgan J.J., 1981, Aquatic chemistry, Wiley, New York Sienko M.J., Plane R.A., 1980, Chemia. Podstawy i własności, Wyd. PWN, Warszawa (In Polish) Publications provided by the teacher
eResources addresses	

Example issues/ example questions/ tasks being completed	Conducting laboratory analyses. Data analyzis, graphical and statistical processing of data.
Work placement	Not applicable

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