

Subject card

Subject name and code	Chemical oceanography - laboratory exercises, PG_00118111						
Field of study	Oceanography						
Date of commencement of studies	October 2024	Academic year of realisation of subject			2025/2026		
Education level	undergraduate studies	Subject group			Obligatory subject group 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			4.0		
Learning profile	academic	Assessment form					
Conducting unit	Katedra Oceanografii Chemicznej i Geologii Morza -> Faculty of Oceanography and Geography						
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	0.0	0.0	60.0	0.0	0.0	60
	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	60		0.0		0.0	60
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-U03	Is able to analyze the results of chemical analysis and formulate conclusions based on them	[SU2] presentation/project/paper/report
	[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	I willing to plan and execute the next steps of chemical analysis and be responsible for the results obtained, is ready to perform various roles in the team	[SK6] demonstration of practical skills [SK8] observation of student's independent or team work
	OCEANL3-U11	Is able to work independently and in a laboratory group while performing chemical analyses, is able to perform various tasks and perform various functions in a group	[SU8] observation of student's independent or team work
	OCEANL3-W05	Knows analytical techniques, research methods and statistical tools used in the work of an oceanographer to describe and interpret chemical processes in the marine environment	[SW4] test/exam - oral or written [SW2] presentation/project/paper/report
	[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	[SK8] observation of student's independent or team work
	OCEANL3-W04	Knows and understands research problems in chemical oceanography and awareness of their connections with other disciplines of science	[SW2] presentation/project/paper/report
	OCEANL3-U04	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-W02	Knows and understands the basic chemical processes occurring in the marine environment	[SW4] test/exam - oral or written [SW2] presentation/project/paper/report [SW3] text preparation/written work	
Subject contents	<ul style="list-style-type: none"> • Spectrophotometry and atomic absorption in the analysis of nutrients and major ions in seawater (Lambert Beer's law, calibration methods - point and linear); • Methods of sampling and preservation of seawater samples for chemical analysis; • Performance of calibration based on chemical standards and determination of nutrients and macronutrients in seawater samples in the coastal zone of the Gulf of Gdańsk; • Analysis of the obtained results using statistical and graphical methods, error analysis, synthetic presentation of the results in the form of a report, comparison with the data available on the 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 the parameter in the marine environment; • Analysis and presentation of the variability of concentrations of nutrients and major ions in the ocean; • Independent organization of the workplace, selection of laboratory techniques and analytical procedures for conducting analyses of nutrients and macronutrients in seawater. 		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
		51.0%	10.0%
		51.0%	10.0%
		51.0%	30.0%
		51.0%	40.0%
	51.0%	10.0%	

Recommended reading	Basic literature	<p>Falkowska L., Bolałek J., Łysiak-Pastuszek E., 1999, Analiza chemiczna wody morskiej, cz. 2., Wyd.UG, Gdańsk (In Polish)</p> <p>Bolałek J., Falkowska L., 1999, Analiza chemiczna wody morskiej, cz. 1., Wyd. UG, Gdańsk (In Polish)</p> <p>Korzeniewski K., 1995, Podstawy oceanografii chemicznej, Wyd. UG, Gdańsk (In Polish)</p> <p>Horne R.A., 1969, Marine chemistry, Wiley, New York</p> <p>Riley J.P., Chester R., 1971, Introduction to marine chemistry, Academic Press, London</p> <p>Riley J.P., Skirrow G., 1975, Chemical oceanography, Wyd. Academic Press, London</p> <p>Millero F.J., 2002. Chemical Oceanography 2nd ed. CRC Press, Boca Raton, Boston, London, New York, Washington, DC, 490.</p>
	Supplementary literature	<p>Korzeniewski K., 1986, Hydrochemia, WSP, Słupsk, Skrypty i Monografie</p> <p>Stumm W., Morgan J.J., 1981, Aquatic chemistry, Wiley, New York</p> <p>Sienko M.J., Plane R.A., 1980, Chemia. Podstawy i własności, Wyd. PWN, Warszawa</p> <p>Publikacje w czasopismach udostępnione przez prowadzącego.</p>
	eResources addresses	<p>Uzupełniające</p> <p>Adresy na platformie eNauczanie:</p>
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	

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