

Subject card

Subject name and code	Field courses at sea and in the coastal zone, PG_00121140						
Field of study	Oceanography						
Date of commencement of studies	October 2024	Academic year of realisation of subject			2024/2025		
Education level	postgraduate 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	1	Language of instruction			Polish		
Semester of study	2	ECTS credits			5.0		
Learning profile	academic	Assessment form					
Conducting unit	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	90.0	0.0	0.0	0.0	90
	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	90		15.0		25.0	130
Subject objectives	Learning about the operation of instruments and water and sediment samplers. Planning research, performing chemical measurements, verifying the reliability of the results. Preservation of samples and analysis in the laboratory on land. Interpretation of results. Learning the principles of safe work at sea and in the laboratory. Developing skills in conducting interdisciplinary oceanographic research and cooperation in a research team (20 h in interdisciplinary teams to learn about methods in biological oceanography, physical oceanography, marine geology, geophysics and marine biotechnology).						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[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 individually and in a group, performs various roles in the group, including leadership, and executes assigned tasks related to the investigation of marine and atmospheric chemistry	[SU8] observation of student's independent or team work
	[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	Can independently carry out tests and measurements in marine and atmospheric chemistry, both in the field and laboratory, using appropriately selected measuring and analytical techniques	[SU2] presentation/project/paper/report [SU8] observation of student's independent or team work
	[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	Knows in depth the principles principles of planning and conducting field and laboratory research, as well as methods and tools used in oceanography with particular emphasis on marine and atmospheric chemistry	[SW2] presentation/project/paper/report [SW5] implementation of a problem task
	[OCEANMU2-K05] is ready to follow the rules occupational health and safety, taking care of the entrusted person specialized and recognition equipment emergency situations and take appropriate action activities	Is ready to comply with health and safety rules in the field and laboratory, take care of measuring equipment and samplers and is aware of the risks and hazards associated with working at sea and in a chemical laboratory	[SK8] observation of student's independent or team work
	[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, cooperates effectively in the team and performs its functions in it various functions, including managerial ones	Is ready to plan and execute the subsequent stages of work in the sea and chemical laboratory, work effectively in a team, and take responsibility for the results obtained	[SK2] presentation/project/paper/report [SK8] observation of student's independent or team work
	[OCEANMU2-W08] knows and understands safety and hygiene rules oceanographer's work in the laboratory, in the sea and in the coastline zone and on the ship	Knows the health and safety rules of an oceanographer in a chemical laboratory, at sea and in the coastal zone	[SW1] oral statement/conversation/discussion
	[OCEANMU2-W03] knows and understands research methods used in oceanography and related sciences	Knows in depth the research methods used in the study of marine and atmospheric chemistry	[SW2] presentation/project/paper/report [SW5] implementation of a problem task

Subject contents	<ol style="list-style-type: none"> Participation in a cruise in the Baltic Sea. Preparation of necessary reagents and equipment before and after the cruise. Working in groups. Training on health and safety regulations for work at sea. Familiarization with alarms: for life-saving measures, fire alarm. Measurement of physical parameters in the water column, among others: temperature, salinity, sound velocity (CTD probe) and basic meteorological parameters. Geographical coordinates and depth of the measuring station - map of the location of measuring stations. Collection of water for analysis of dissolved, suspended and gaseous substances (bathymetric bottle, rosette of bathometers, others, e.g., Garrett net), sediments for chemical analysis (intact sediments), division of sediments into layers, techniques for recovery of interstitial waters from sediments (centrifugation, Rhizon type samplers) of different grain sizes. Determination in the shipboard laboratory of selected chemical compounds in samples, such as the concentration of biogenic substances, oxygen and pH. Filtration of seawater samples taking into account the type of chemical compounds analyzed in suspension. Analysis of compounds with high concentrations in small volume samples. Storage and preservation of collected samples of water, suspended solids and sediments, taking into account the type of analysis planned. Analysis of the results obtained during the cruise, assessment of the precision of the analyses carried out (error analysis, calibration of equipment), critical verification of the results obtained. Evaluation of spatial distributions of chemical and physical parameters characterizing the waters and sediments of the southern Baltic Sea; maps of the distribution of parameters and vertical distribution (chemocline, halocline, thermocline). Graphical and statistical processing and description of the results. Comparison of results with monitoring and literature data (HELCOM, PIG, IMGW, hydrodynamic models). Advanced methods used in the study of biogeochemical and physical processes in the sea (module in marine biology, marine and atmospheric chemistry, marine geology and marine physics). The use, depending on the planned research, of measuring devices/samplers, among others. : CTD probe, acoustic current profiler (Acoustic Doppler Current Profiler - ADCP), hydroacoustic equipment (side scan sonar, multibeam echosounder, subbottom profiler), autonomous underwater vehicle (ROV), bathymetric rosette, automatic weather station, multi sediment trap, sediment samplers, plankton nets and others. 											
Prerequisites and co-requisites												
Assessment methods and criteria	<table border="1"> <thead> <tr> <th data-bbox="459 947 794 976">Subject passing criteria</th> <th data-bbox="802 947 1137 976">Passing threshold</th> <th data-bbox="1145 947 1481 976">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="459 981 794 1032">Observation of work in class, discussion</td> <td data-bbox="802 981 1137 1032">51.0%</td> <td data-bbox="1145 981 1481 1032">10.0%</td> </tr> <tr> <td data-bbox="459 1037 794 1066">Research report, worksheets</td> <td data-bbox="802 1037 1137 1066">51.0%</td> <td data-bbox="1145 1037 1481 1066">90.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Observation of work in class, discussion	51.0%	10.0%	Research report, worksheets	51.0%	90.0%
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Recommended reading	Basic literature	<p>Zaawansowane metody interdyscyplinarnych badań Morza Bałtyckiego przygotowany w ramach projektu POWER ProUG (In Polish) Falkowska L., Bolałek J., Łysiak-Pastuszek E., 1999, Analiza chemiczna wody morskiej 2, Pierwiastki biogeniczne N, P, Si, Fe, Wyd. UG, Gdańsk (In Polish) Bolałek J., (red.) 2010, Fizyczne, biologiczne i chemiczne badania morskich osadów dennych. Wydawnictwo UG, Gdańsk (In Polish)</p> <p>Raporty IMGW, WIOŚ, HELCOM, model hydrodynamiczny południowego Bałtyku, prognozy pogody, system SatBałtyk</p>										
	Supplementary literature	<p>Bolałek J., Falkowska L., 1999, Analiza chemiczna wody morskiej 1, Makroskładniki i gazy rozpuszczone w wodzie morskiej, Wyd. UG, Gdańsk (In Polish)</p> <p>Rózdzyński K., Miernictwo oceanograficzne, tom 1-12, IMGW, Warszawa 1996 (In Polish)</p>										
	eResources addresses	<p>Podstawowe</p> <p>https://baltyk.imgw.pl - Cruise reports from IMGW, weather forecast</p> <p>https://helcom.fi/ - Data and reports from HELCOM</p> <p>http://www.satbaltyk.pl - System SatBałtyk</p> <p>https://model.ocean.ug.edu.pl/ - Ecohydrodynamic model for southern Baltic Sea</p> <p>Adresy na platformie eNauczanie:</p>										
Example issues/ example questions/ tasks being completed												
Work placement	Not applicable											