

**Subject card**

<b>Subject name and code</b>	Oceanographic instruments and measurements - Lecture, PG_00054224						
<b>Field of study</b>	Oceanography						
<b>Date of commencement of studies</b>	October 2024	<b>Academic year of realisation of subject</b>			2024/2025		
<b>Education level</b>	postgraduate studies	<b>Subject group</b>			Obligatory subject group in the field of study		
<b>Mode of study</b>	full-time studies	<b>Mode of delivery</b>			at the university		
<b>Year of study</b>	1	<b>Language of instruction</b>			Polish Polish		
<b>Semester of study</b>	1	<b>ECTS credits</b>			2.0		
<b>Learning profile</b>	academic	<b>Assessment form</b>					
<b>Conducting unit</b>	Faculty of Oceanography and Geography						
<b>Name and surname of lecturer (lecturers)</b>	<b>Subject supervisor</b>		dr hab. Dorota Burska				
	<b>Teachers</b>		dr hab. Dorota Burska dr Dominik Pałgan dr Jakub Idczak				
<b>Lesson types</b>	<b>Lesson type</b>	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	<b>Number of study hours</b>	30.0	0.0	0.0	0.0	0.0	30
	E-learning hours included: 0.0						
<b>Learning activity and number of study hours</b>	<b>Learning activity</b>	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	<b>Number of study hours</b>	30		4.0		20.0	54
<b>Subject objectives</b>	Theoretical knowledge of the principles of instruments/devices and measurement platforms used today in oceanographic research and the use of the existing database to solve research, environmental, management problems.						
<b>Learning outcomes</b>	<b>Course outcome</b>		<b>Subject outcome</b>			<b>Method of verification</b>	
	[OCEANMU2-W03] knows and understands research methods used in oceanography and related sciences		He knows and understands in an advanced way the research methods used in assessographic surveying, in terms of modern sensors and devices used for in situ measurements and specialized software used for conducting measurements, describing and interpreting phenomena and processes occurring in the aquatic environment, especially the marine environment.			[SW4] test/exam - oral or written	
	[OCEANMU2-K04] is ready to critically evaluate his/her knowledge and received content in the field of natural sciences in particular in the field of the studied specialty, a in problematic situations, supports oneself with knowledge experts		He is ready to critically evaluate his knowledge of modern equipment and sensors used in oceanographic surveying and to support himself with expert knowledge in solving problems.			[SK4] test/exam - oral or written	

Subject contents	1 Principle of operation of selected instruments/equipment used in modern marine physics, chemistry and geology research. 2 Measurement platforms (manned/unmanned vessels, floating buoys, moored, etc.): principle of operation, measurement range, data sharing. 3 Methods and equipment used for atmospheric, marine and seabed sampling, depending on the material or measurement required. 4 Sampling requirements, methodology and strategies related to the design of scientific and environmental monitoring programs.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	test3	51.0%	33.3%
	test2	51.0%	33.3%
	test1	51.0%	33.4%
Recommended reading	Basic literature	<p>1 Rózdzyński K., (1996) Oceanographic surveying, vol. 1-12, IMGW, Warsaw (in Polish).</p> <p>2 Bolałek J., (red.) 2010, Physical, biological and chemical studies of marine bottom sediments. 2010. Wydawnictwo UG, Gdańsk (in Polish).</p> <p>3. Lekkerkerk, H. J., Van der Velden, R., Roders, J., Haycock, T., De Vries, R., Jansen, P., Beemster, C. (2006) Handbook of Offshore Surveying-Acquisition and Processing. Clarkson Research Services, London.</p> <p>4 Brzózka Z., Malinowska E., Wróblewski W., (2022) Sensory chemiczne i biosensor, Wydawnictwo Naukowe PWN, Warsaw (in Polish).</p>	
	Supplementary literature	<p>1. Instructions for use of equipment/instrumentation.</p> <p>2. Reports from IMGW, WIOŚ, HELCOM, hydrodynamic model of the southern Baltic Sea, weather forecasts, SatBaltic platform, GOOS, NOA, scientific articles.</p>	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	<p>1 Determination of dissolved oxygen can be carried out using electrochemical sensors (galvanic, polarographic), among others. Give the most important characteristics of these sensors. 2 State in what range is the relative spectral emissivity of water in the band 8 - 14 mm in the direction perpendicular to the water surface. 3. Detailed studies (according to the protocol of probing studies of SMS deposits) are carried out with what platforms?</p>		
Work placement	Not applicable		

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