

**Subject card**

<b>Subject name and code</b>	Oceanographic Instruments and Measurements - lecture, PG_00204955						
<b>Field of study</b>	Oceanography						
<b>Date of commencement of studies</b>	October 2026	<b>Academic year of realisation of subject</b>			2026/2027		
<b>Education level</b>	Master's 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		
<b>Semester of study</b>	1	<b>ECTS credits</b>			2.0		
<b>Learning profile</b>	academic	<b>Assessment form</b>			credit		
<b>Conducting unit</b>	Faculty of Oceanography and Geography -> Rector						
<b>Name and surname of lecturer (lecturers)</b>	<b>Subject supervisor</b>		dr hab. Dorota Burska				
	<b>Teachers</b>						
<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		2.0		18.0	50
<b>Subject objectives</b>	Theoretical knowledge of the principles of instruments/devices and measurement platforms used today in oceanographic research and the use of existing databases to solve research, environmental and management problems.						
<b>Learning outcomes</b>	<b>Course outcome</b>		<b>Subject outcome</b>			<b>Method of verification</b>	
	[OCEANMU2-W03] has an in-depth understanding of research methods used in oceanography and related sciences, and interprets their mechanisms and interrelationships across different spatial and temporal scales		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			[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		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	<p>1.Principle of operation of selected instruments/equipment used in modern marine physics, chemistry and geology research; measurement uncertainties and regression analysis.</p> <p>2.Measurement platforms (manned/unmanned vessels, floating buoys, moored, etc.);principle of operation, measurement range, data sharing.</p> <p>3.Ocean Observatories Initiative (OOI): objectives, infrastructure, research, functioning global observatory fixed systems, scientific expeditions, repositories and access to data.</p> <p>4.Sampling requirements, methodology and strategies related to the design of scientific and environmental monitoring programs.</p>														
Prerequisites and co-requisites															
Assessment methods and criteria	<table border="1"> <thead> <tr> <th data-bbox="456 719 794 748">Subject passing criteria</th> <th data-bbox="799 719 1137 748">Passing threshold</th> <th data-bbox="1142 719 1481 748">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="456 754 794 781">test3</td> <td data-bbox="799 754 1137 781">51.0%</td> <td data-bbox="1142 754 1481 781">33.0%</td> </tr> <tr> <td data-bbox="456 788 794 815">test2</td> <td data-bbox="799 788 1137 815">51.0%</td> <td data-bbox="1142 788 1481 815">33.0%</td> </tr> <tr> <td data-bbox="456 822 794 848">test1</td> <td data-bbox="799 822 1137 848">51.0%</td> <td data-bbox="1142 822 1481 848">34.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	test3	51.0%	33.0%	test2	51.0%	33.0%	test1	51.0%	34.0%
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Recommended reading	Basic literature	<p>1.Rózdzyński K., (1996) Oceanographic surveying, vol. 1-12, IMGW, Warsaw (in Polish).</p> <p>2. Szydlowski H. 1981, Theory of measurements, PWN Warszawa,</p> <p>3.Bolalek J., (red.) 2010, Physical, biological and chemical studies of marine bottom sediments. 2010.Wydawnictwo UG, Gdańsk (in Polish).</p> <p>4.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 Processin. Clarkson Research Services, London.</p> <p>5. Brzózka Z., Malinowska E., Wróblewski W.,(2022) Sensory chemistry and biosensor, Wydawnictwo Naukowe PWN, Warszawa.</p> <p>6.The online platform of the international Ocean Observatories Initiative (OOI) programme, <a href="https://oceanobservatories.org/">https://oceanobservatories.org/</a> and the publications available on it.</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> <p>3. Websites: <a href="https://hydro.imgw.pl">https://hydro.imgw.pl</a>, <a href="https://www.iopan.gda.pl/hydrodynamics/po/Argo/argo_pl.html">https://www.iopan.gda.pl/hydrodynamics/po/Argo/argo_pl.html</a>, <a href="https://nafalinauki.pl/argonauki-w-sluzbie-nauki-cz-1">https://nafalinauki.pl/argonauki-w-sluzbie-nauki-cz-1</a></p>													
	eResources addresses														

<p>Example issues/ example questions/ tasks being completed</p>	<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.</p> <p>2. State in what range the relative spectral transmittance of water in the 814 nm band in the direction perpendicular to the water surface falls.</p> <p>3. Discussion of infrastructure included in OOI (e.g. cables, moorings, profilers, AUVs), discussion of example systems, e.g. Axial Seamount, Continental Margin or Global Southern Ocean, discussion of publicly available online databases.</p>
<p>Work placement</p>	<p>Not applicable</p>

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