University of Gdańsk

Subject card

Subject name and code	Oceanographic Instruments and Measurements - Lecture, PG_00204993		
Field of study	Oceanography		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2026/2027
Education level	Master's studies	Subject group	Obligatory subject group in the field of study Optional subject group 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	1	Language of instruction	Polish
Semester of study	1	ECTS credits	2.0
Learning profile	academic	Assessment form	credit
Conducting unit	Faculty of Oceanography and Geography -> Rector		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. Dorota Burska, prof. UG	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	0.0	0.0	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

Theoretical knowledge of the principles of instruments/devices and measurement platforms used today in oceanographic research (physical, chemical and geological) and the use of the existing database to solve research, environmental, management problems.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[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-depth, advanced research methods used in oceanographic metrology, as pertains to (a) modern sensors and devices used for in situ measurements and (b) specialized software used to conduct measurements, describe and interpret the phenomena and processes occurring in marine and aquatic environments.	[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 in particular in the field of the studied specialty, a in problematic situations, supports oneself with knowledge experts	is ready to critically evaluate his/her knowledge of modern equipment and sensors used in oceanographic surveying and to seek expert support 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; measurement uncertainties and regression analysis. 2.Measurement platforms (manned/unmanned vessels, floating buoys, moored, etc.):principle of operation, measurement range, data sharing. 3.Ocean Observatories Initiative (OOI): objectives, infrastructure, research, functioning global observatory fixed systems, scientific expeditions, repositories and access to data. 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
midterm test 2	51.0%	33.0%
midterm test 1	51.0%	34.0%
midterm test 3	51.0%	33.0%

Recommended reading

Basic literature	1. Różdżyński K., (1996) Oceanographic surveying, vol. 1-12, IMGW, Warsaw (in Polish). 2. Szydłowski H. 1981, Theory of measurements, PWN Warszawa, 3. Bolałek J., (red.) 2010, Physical, biological and chemical studies of marine bottom sediments. 2010.Wydawnictwo UG, Gdańsk (in Polish). 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. 5. Brzózka Z., Malinowska E., Wróblewski W.,(2022) Sensory chemistry and biosensor, Wydawnictwo Naukowe PWN, Warszawa. 6. The online platform of the international Ocean Observatories Initiative (OOI) programme, https://oceanobservatories.org/ and the publications available on it.
Supplementary literature	1. Instructions and manuals for use of equipment/instrumentation. 2. Reports from IMGW, WIOŚ, HELCOM, hydrodynamic model of thesouthern Baltic Sea, weather forecasts, SatBaltic platform, GOOS,NOA, scientific articles. 3. Websites: https://hydro.imgw.pl, https://www.iopan.gda.pl/hydrodynamics/po/Argo/argo_pl.html, https://nafalinauki.pl/argonauciw-sluzbie-nauki-cz-1
eResources addresses	

Example issues/ example questions/ tasks being completed	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 the relative spectral transmittance of water in the 814 nm band in the direction perpendicular to the water surface falls. 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.
Work placement	Not applicable

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