

Subject card

Subject name and code	Satellite oceanography - laboratory exercises, PG_00117777						
Field of study	Oceanography						
Date of commencement of studies	October 2025		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	2		Language of instruction		Polish		
Semester of study	3		ECTS credits		2.0		
Learning profile	academic		Assessment form		credit		
Conducting unit	Laboratory of Physical Oceanography -> Department of Physical Oceanography and Climate Research -> Faculty of Oceanography and Geography -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Katarzyna Bradtke				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	30.0	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		1.0		29.0	60
Subject objectives	Developing skills in utilizing satellite databases and processing and analyzing this data to obtain qualitative and quantitative information about processes occurring in the sea, as well as validating the obtained results.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[OCEANMU2-W03] knows and understands research methods used in oceanography and related sciences	The student knows and understands in-depth research methods used in the work of an oceanographer to describe and interpret phenomena and processes occurring in the aquatic environment using satellite data	[SW2] presentation/project/paper/report [SW5] implementation of a problem task
	[OCEANMU2-U06] can use specialized computer software and advanced mathematical and statistical methods in data analysis and description of processes and phenomena occurring in the marine environment and coastal zone	The student is able to use specialized computer software and advanced mathematical and statistical methods in the analysis of satellite data and the description of processes and phenomena occurring in the marine environment and coastal zone.	[SU5] implementation of a problem task [SU8] observation of student's independent or team work
	[OCEANMU2-W04] knows and understands the latest research trends in the field of oceanography as well as the possibilities of practical application of scientific achievements	The student knows and understands in-depth the latest trends in oceanographic research using satellite remote sensing devices and systems, as well as the possibilities of practical application.	[SW2] presentation/project/paper/report
	[OCEANMU2-K03] is ready to effectively organize his/her own work, is active and persistent and punctuality in completing tasks, is ready to carrying out evaluation of their own activities	The student is ready to effectively organize his/her own work on the analysis of satellite data, is active and is characterized by perseverance and punctuality in the implementation of analysis results.	[SK8] observation of student's independent or team work
Subject contents	1. Satellite Data Sources and Formats 2. Data Acquisition and Preprocessing 3. Visualization and Analysis of Physical Parameters 4. Satellite Data Validation in Hydrodynamic Models (Altimetry and Passive Microwave Remote Sensing) 5. Identifying and Characterizing Marine Phenomena Using Satellite Data, including the extent and type of ice cover in the circumpolar regions, oil spills, analysis of iceberg trajectories, creation of bathymetric maps, analysis of anomalies related to ENSO phases, etc.		
Prerequisites and co-requisites	Knowledge of the fundamentals of physical oceanography, basics of remote sensing, and GIS. Proficiency in working within a Windows environment, and familiarity with ArcGIS Pro.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	reports on tasks performed	51.0%	100.0%
Recommended reading	Basic literature	- Robinson I., 2010. Discovering the Oceans from Space: The unique applications of satellite oceanography, Springer-Verlag, Berlin and Heidelberg - Emery W., Camps A., 2017, Introduction to Satellite Remote Sensing. Atmosphere, Ocean, Land and Cryosphere Applications, Elsevier	
	Supplementary literature	- Berizzi F., Martorella M., Giusti E., 2016, Radar Imaging for Maritime Observation, CRC Prss, Taylor & Francis Group 348 s. - Martin S., 2004, An introduction to Ocean Remote Sensing, Cambridge University Press, 426 s. - Chapman R., Gasparovic R., 2022, Remote sensing physics: an introduction to observing earth from space, Wiley, Hoboken USA, 468 ss. - Chang N.-B., Bai K., 2018, Multisensor data fusion and machine learning for environmental remote sensing, CRC Press, Boca Raton, 508 ss.	
	eResources addresses		

Example issues/ example questions/ tasks being completed	Credit based on the results of the work done during the exercises and reports with the elaboration of these results (student's own work). Assessment criteria: • ability to use satellite databases, • ability to use software for analyzing satellite and GIS data in practice, • ability to interpret the results of satellite data analysis.
Work placement	Not applicable

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