University of Gdańsk

Subject card

Subject name and code	Satellite Oceanography - laboratory , PG_00204983		
Field of study	Oceanography		
Date of commencement of studies	October 2027	Academic year of realisation of subject	2028/2029
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 Aleksandra Cupiał	
	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	2.0	18.0	50

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-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.	[SK2] presentation/project/paper/ report
[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	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	[SW5] implementation of a problem task
[OCEANMU2-W04] has an in-depth understanding of the latest research trends in oceanography, as well as the possibilities for practical application of related achievements; evaluates their usefulness and limitations in solving scientific research problems, and critically analyzes and assesses their applicability	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-U06] is able to use specialized computer software as well as advanced mathematical and statistical methods to analyze data and describe processes and phenomena occurring in the marine and coastal environment; evaluates their reliability and usefulness and performs critical analysis	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.	[SU2] presentation/project/paper/ report [SU5] implementation of a problem task

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
Report	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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