

Subject card

Subject name and code	Satellite Oceanography, PG_00131550						
Field of study	Marine Hydrography						
Date of commencement of studies	October 2024	Academic year of realisation of subject			2027/2028		
Education level	Bachelor's studies	Subject group			Optional subject group Subject group related to practical vocational preparation		
Mode of study	full-time studies	Mode of delivery			at the university		
Year of study	4	Language of instruction			Polish		
Semester of study	7	ECTS credits			2.0		
Learning profile	practical	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						
	Additional information: Computer workshops (10 meetings x 3h): analysis of satellite data using specialized computer software. The exercises are supplemented by the student's own work, which involves performing analyzes and reporting the results in order to consolidate the acquired knowledge and skills. If necessary, no more than 2 meetings may be conducted online						
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		20.0	52
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
	[HML3-U11] use navigation devices, means of technical observation and communication as well as measuring instruments, as well as apply in practice various techniques of measurement and observation in the field of professional activity related to the field of study	The student is able to use in practice satellite observation techniques and spatial data analysis tools in the professional activity of a hydrographer	[SU5] implementation of a problem task [SU8] observation of student's independent or team work
	[HML3-W03] directions of development and the latest discoveries in the field of scientific disciplines forming the theoretical basis appropriate to the field of study	The student knows and understands the directions of development and the latest discoveries in the use of satellite observation techniques and image analysis in marine hydrography	[SW2] presentation/project/paper/report [SW5] implementation of a problem task
	[HML3-W04] the issue of measurements related to the exploration of sea basins and inland waters and tools allowing to describe, interpret and present the results of measurements	The student knows and understands the methods, techniques and research tools used in physical research of seas and oceans using satellite techniques	[SW2] presentation/project/paper/report [SW5] 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
		50.0%	100.0%
Recommended reading	Basic literature	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> 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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