University of Gdańsk

Subject card

Subject name and code	Introduction to Remote Sensing of The Environment - lecture, PG_00201432						
Field of study	Water Management and Protection of Water Resources						
Date of commencement of studies	October 2026		Academic year of realisation of subject	2027/2028			
Education level	Bachelor's studies		Subject group	Obligatory subject group in the field of study Subject group related to practical vocational preparation			
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	1.0			
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	15.0	0.0	0.0	0.0	0.0	15
	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	15		1.0		9.0	25
Subject objectives	This course aims to equip students with the principles and techniques of satellite remote sensing, focusing on data processing, interpretation for environmental monitoring, and hydrological modeling.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[GWOZWL3-W04] The student is familiar with advanced research techniques, methods and tools currently used in water management and the protection of water resources, in both the natural and social sciences, including advanced statistical and IT tools enabling the description, modelling and interpretation of data concerning phenomena and processes occurring in the aquatic environment, as well as tools for describing relationships within socio-ecological systems.	The student knows and understands satellite techniques and satellite data processing tools currently used in water management and water resources protection.	[SW4] test/exam - oral or written
[GWOZWL3-W02] The student knows and understands the importance of advanced knowledge in the sciences allowing to understand the processes and phenomena occurring in the hydrosphere, as well as knowledge of the social sciences and of the Earth's geographic environment - as a a system of interrelated and interacting components.	The student understands the importance of knowledge in the field of exact sciences allowing understanding the processes and phenomena occurring in the hydrosphere as a system of interconnected and interacting components.	[SW4] test/exam - oral or written

Subject contents

1. Electromagnetic radiation as a carrier of information about the environment
2. Remote sensing devices and techniques. Satellite systems used in environmental research.
3. Physical basis of passive remote sensing in the range of VIS-SWIR radiation and radar imaging
4. Visualization and interpretation of remotely recorded images, basic analysis of optical data
5. Geometric and radiometric distortions of remote sensing images and their correction
6. Image fusion and transformation, spectral indexes, image content classification methods
7. Sources of satellite data and examples of their applications in monitoring of surface water

Prerequisites and co-requisites

knowledge of the basics of water management, cartography and digital data models used in GIS and basic skills in using the ArcGISPro program (in the scope of the subject "Geographic Information Systems - laboratory exercises I")

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
test	51.0%	100.0%

Recommended reading

Basic literature	• Hejmanowska B., Wężyk P. (ed.), Dane satelitarne dla administracji publicznej, Polska Agencja Kosmiczna 2020; https://polsa.gov.pl/wp-content/themes/polsa/files/Podrecznik.pdf
Supplementary literature	• Szturc J., Teledetekcja satelitarna i radarowa w meteorologii i hydrologii, Wydawnictwo ATH, Bielsko-Biała 2004 • Kurczyński Z., Lotnicze i satelitarne obrazowanie Ziemi. Oficyna Wyd. Polit. Warsz., Warszawa 2006. • Xiaojun Yang (red.), Remote Sensing and Geospatial Technologies for Coastal Ecosystem Assessment and Management, Springer 2009 • Lillesand T.M., Kiefer R.W., Remote sensing and image interpretation, Wiley 2000
eResources addresses	

Example issues/ example questions/ tasks being completed

The criteria for passing the lecture are based on a final test. The following aspects will be considered in the evaluation:

- Understanding of basic concepts in the field of remote sensing,
- Familiarity with basic satellite remote sensing systems,
- Understanding of the physical foundations of remote sensing and knowledge of the properties of objects that can be studied remotely using devices that record electromagnetic radiation,
- Knowledge of properties and basic methods of raster data analysis.

The final grade will be awarded based on the number of points obtained from the test, in accordance with the grading scale specified in the UG Study Regulations.

Work placement

Not applicable

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