University of Gdańsk

Subject card

Subject name and code	Introduction to Satellite Remote Sensing - laboratory , PG_00206147		
Field of study	Oceanography		
Date of commencement of studies	October 2027	Academic year of realisation of subject	2029/2030
Education level	Bachelor'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	3	Language of instruction	Polish
Semester of study	5	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	40.0	0.0	0.0	40

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	40	3.0	7.0	50

Subject objectives

Preparing students to use satellite data and image processing programs to describe phenomena occurring in the marine environment, as well as familiarizing them with the basic methods of analyzing raster data.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[OCEANL3-U05] is able to use general-purpose and specialized software, as well as mathematical and statistical methods, in data analysis and the presentation of results	The student is able to use utility and specialized software, as well as mathematical and statistical methods in the analysis of satellite data and the presentation of results	[SU3] text preparation/written work [SU5] implementation of a problem task
[OCEANL3-W05] has an advanced knowledge of techniques, research methods, and tools (mathematical, statistical, and computational) used by oceanographers to describe and interpret processes and phenomena occurring in the marine environment	The student has advanced knowledge of techniques, research methods and IT tools used in the work of an oceanographer to describe and interpret processes and phenomena occurring in the marine environment using satellite data	[SW3] text preparation/written work [SW5] implementation of a problem task

Subject contents

1. Satellite data sources and formats. Data acquisition. Specialized software for visualization and data pre-processing.
2. Visualization of raster data, contrast enhancement, use of color palettes
3. Examples of maps of geophysical quantities created on the basis of satellite data recorded using various techniques (high-level satellite products - L2, L3) and their exploration, including: the use of cloud and land masks, validation of satellite data; identification of objects/structures, their extraction and characterization; analysis of changes over time
4. Examples of satellite data recorded in the thermal, infrared and visible ranges at lower levels of processing
5. Application of color composites, spectral enhancement, index analysis,
6. Atmospheric correction, processing to higher levels

<table>
<tr><td>Prerequisites and co-requisites</td><td colspan="3">basic computer skills (Windows environment), basic knowledge of cartography and digital data models (scope of courses: "ABC IT", "Technologia informacyjna - ćw. laboratoryjne", "Mapy i GIS - ćw. laboratoryjne")</td></tr>
<tr><td>Assessment methods and criteria</td><td colspan="3"><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>independent task solving 2</td><td>51.0%</td><td>25.0%</td></tr>
<tr><td>report 1</td><td>51.0%</td><td>25.0%</td></tr>
<tr><td>report 2</td><td>51.0%</td><td>25.0%</td></tr>
<tr><td>independent task solving 1</td><td>51.0%</td><td>25.0%</td></tr>
</table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td colspan="2">• 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
• Emery W., Camps A., 2017, Introduction to Satellite Remote Sensing. Atmosphere, Ocean, Land and Cryosphere Applications, Elsevier
• Emilio Chuvieco, 2016, Fundamentals of Satellite Remote Sensing, CRC Press</td></tr>
<tr><td>Supplementary literature</td><td colspan="2">• Martin S., 2014, An introduction to ocean remote sensing. Wydanie drugie. Cambridge University Press
• Robinson I.S., 2004, Measuring the oceans from space : the principles and methods of satellite oceanography, Springer
• Adamczyk J., Będkowski K., 2007, Metody cyfrowe w teledetekcji. Wyd. SGGW, Warszawa</td></tr>
<tr><td>eResources addresses</td><td colspan="2"></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="3">Assessment criteria:
• ability to use satellite data analysis software in practice
• ability to select data transformation and analysis methods to solve specific research problems based on satellite data
• ability to interpret satellite data and the results of their analysis in the context of analyzing phenomena and processes occurring in the natural environment</td></tr>
<tr><td>Work placement</td><td colspan="3">Not applicable</td></tr>
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