GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Methods of remote sensing analysis, PG_00045751						
Field of study	Geodesy and Cartography						
Date of commencement of studies	February 2023		Academic year of realisation of subject	2023/2024			
Education level	second-cycle studies		Subject group				
Mode of study	Full-time studies		Mode of delivery	at the university			
Year of study	1		Language of instruction	Polish			
Semester of study	2		ECTS credits	5.0			
Learning profile	general academic profile		Assessment form	assessment			
Conducting unit	Department of Geodesy -> Faculty of Civil and Environmental Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Krystyna Michałowska					
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	30.0	15.0	0.0	0.0	75
	E-learning hours included: 0.0						
	Address on the e-learning platform: https://enauczanie.pg.edu.pl/moodle/index.php?id=8243						
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	75	10.0	40.0	125		
Subject objectives	Acquisition of knowledge and skills in the methods of advanced processing of airborne and satellite images as well as analysis and interpretation of multispectral and multi-temporal remote-sensing studies.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_U05] can choose, depending on the nature of the study, methods for assessing the quality of photogrammetric and remote sensing products and elaborations.	Has the ability to analyze the accuracy and quality of remote sensing data on the basis of geometric and radiometric parameters of images, is able to select the appropriate specification of source data in order to obtain optimal results of remote sensing studies.	[SU2] Assessment of ability to analyse information
[K7_U03] can make the interpretation of aerial and satellite photos and develop products based on remote sensing data	Has the ability to analyze and interpret source and processed remote sensing data obtained from the airborne and satellite ceiling. He/she is able to prepare long-term studies in the form of thematic maps (land cover/use, changes in selected environmental factors), index maps for selected parameters (vegetation, soil, temperature, etc.) and to extract and analyse information on the basis of prepared products.	[SU4] Assessment of ability to use methods and tools [SU2] Assessment of ability to analyse information
[K7_U04] can use the techniques of digital image processing in digital photogrammetry and remote sensing	Can use methods of digital remote sensing image processing to create orthophotomaps, filtering, calibrating, classifying, calculating indicators and creating thematic maps and spatial databases.	[SU4] Assessment of ability to use methods and tools
[K7_W03] has knowledge of the basic physical remote sensing; knows the available photographic materials and satellite data as well as their potential uses; knows the basics of digital image processing and analysis of aerial and satellite image; has deep knowledge of remote sensing applications including knowledge of the usage of remote-sensing methods and technologies of data acquisition for the construction of topographic and thematic databases purpose	Has an extended knowledge of remote sensing and its applications in the visible, infrared and microwave ranges. He knows methods of advanced remote sensing image processing and correction of geometric and radiometric distortions. He knows technologies of creating thematic maps and databases based on remote sensing data.	[SW1] Assessment of factual knowledge
[K7_W04] has knowledge of the digital image processing basics	Has a basic knowledge of techniques of digital processing of panchromatic, multispectral and radar remote sensing images related to the extraction of thematic information.	[SW1] Assessment of factual knowledge

Subject contents

1. Geometric and radiometric correction of remote-sensing images (removal of atmospheric influence, removal of disturbing influence of topography, removal of scanner errors).
2. Processing of remote sensing images: panchromatic, multispectral and radar for the extraction of thematic information.
3. Creating thematic studies using techniques of image filtering, image classification, object classification, indicator calculation, multi-temporal image analysis.
4. Preparation of remote sensing products in the form of thematic maps (land cover/use, changes in selected environmental factors), index maps for selected parameters (vegetation, soil, temperature, etc.), maps of spatial and time variability.
5. Spatial-temporal analyses and interpretation of source and processed remote-sensing data obtained from air and satellite ceilings.
6. Extraction and analysis of information on the basis of multispectral and multi-temporal remote sensing products.

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
	60.0%	10.0%
	51.0%	35.0%
	60.0%	5.0%
	60.0%	10.0%
	60.0%	15.0%
	60.0%	5.0%
	60.0%	5.0%
	60.0%	15.0%

Recommended reading

Basic literature

	Supplementary literature	1. Mularz S.: Basics of remote sensing. Introduction to GIS. PK Publishing House, 2004. 2. Pirowski T.: Ranking of methods of integration of remote sensing images of different resolution - evaluation of photo-interpretation values of data integration LANDSAT TM and IRS-PAN, Archive of Photogrammetry, Cartography and Remote Sensing; 2010
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	