



Subject card

Subject name and code	Advanced remote sensing methods, PG_00045747						
Field of study	Geodesy and Cartography						
Date of commencement of studies	February 2024	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	1	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. Paweł Tysiąc					
	Teachers	dr inż. Paweł Tysiąc dr inż. Katarzyna Bobkowska					
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						
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	Preparing the student to conduct research on remote sensing of the earth's surface and its processes by explaining theoretical principles, processing algorithms and data products.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K7_U04] can use the techniques of digital image processing in digital photogrammetry and remote sensing	The student has the skills necessary programming for digital image processing in photogrammetry and remote sensing.			[SU4] Assessment of ability to use methods and tools		
	[K7_W04] has knowledge of the digital image processing basics	The student has knowledge indispensable for digital image processing in photogrammetry and remote sensing			[SW3] Assessment of knowledge contained in written work and projects		
	[K7_U03] can make the interpretation of aerial and satellite photos and develop products based on remote sensing data	The student has the skills to thematic data studies remote sensing. Can interpret it accordingly obtained results.			[SU4] Assessment of ability to use methods and tools		
	[K7_U05] can choose, depending on the nature of the study, methods for assessing the quality of photogrammetric and remote sensing products and elaborations.	The student has the skills to product quality assessment remote sensing - e.g. scenes satellite - for the needs surveying studies.			[SU3] Assessment of ability to use knowledge gained from the subject		
	[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	The student has knowledge necessary to obtain data remote sensing. The student has knowledge to digital image processing air and satellite. Student has the knowledge to process remote sensing data at an angle working with databases topographic and thematic.			[SW3] Assessment of knowledge contained in written work and projects		

Subject contents	<p>Providing advanced scientific knowledge on the theory and applications of terrestrial remote sensing:1. Theoretical foundations and advanced concepts of cosmic optical, thermal and microwave remote sensing. In particular, a presentation of the Sentinel-1, -2 and -3 missions and the corresponding ESA Earth Explorer missions along with complementing other systems.2. Applications of Remote Sensing: land use and cover; change detection and time analysis; the condition of vegetation and its disturbances; earth surface temperature; site monitoring and critical infrastructure monitoring; forest biophysical research; monitoring of floods and water bodies; agriculture monitoring; fire detection; city maps; monitoring of the hydrological cycle, etc.3. Practical use of ESA toolkits (eg SNAP) and other tools</p>		
Prerequisites and co-requisites	Basic information on active and passive remote sensing and knowledge of remote sensing data acquisition systems.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
		50.0%	10.0%
		50.0%	60.0%
		50.0%	30.0%
Recommended reading	Basic literature	<p>1. https://www.mdpi.com/journal/remotesensing</p> <p>2. https://www.journals.elsevier.com/isprs-journal-of-photogrammetryand-remote-sensing przegląd artykułów</p>	
	Supplementary literature	<p>1. Emilio Chuvieco, Fundamentals of Satellite Remote Sensing, An Environmental Approach, Third Edition, 3rd Edition</p> <p>2. John A. Richards, Remote Sensing with Imaging Radar (Signals and Communication Technology), 2009th Edition</p> <p>3. Hamlyn G Jones , Robin A Vaughan, Remote Sensing of Vegetation: Principles, Techniques, and Applications, 1st Edition</p>	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		