

。 GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Satellite Remote Sensing, PG_00050016								
Field of study	Space and Satellite Technologies								
Date of commencement of studies	February 2025		Academic year of realisation of subject			2024/2025			
Education level	second-cycle studies		Subject group			Obligatory subject group in the field of study Subject group related to scientific			
Mada of shudu	Full time studios		Mode of delivery			research in the field of study			
Mode of Study						Polish			
Year of study	1					4 0			
	general academic profile		Accompany form			exam			
						ions and Informatics			
	Subject supervisor	Subject superviser							
of lecturer (lecturers)	Teachers		dr hab, inż. Zbigniew Lubniewski						
			dr Inz. Tomas	z Berezowski	-				
Lesson types and methods	Lesson type	Lecture	Tutorial	Laboratory	Projec	t	Seminar	SUM	
of instruction	Number of study hours	30.0	0.0	30.0	0.0		0.0	60	
	E-learning hours included: 0.0								
Learning activity and number of study hours	Learning activity	activity Participation in classes include plan		ed in study Participation in consultation hours		Self-study		SUM	
	Number of study 60 hours		10.0		30.0		100		
Subject objectives	Learning by students on knowledge and practical skills on using remote sensing in Earth environment observation and investigation: land, sea and atmosphere in the context of data acquisition for various applications: terrain topography, vegetation, physical properties, hazards								
Learning outcomes	Course outcome		Subject outcome			Method of verification			
	[K7_U05] Notices, when formulating and solving engineering tasks, their systemic and non-technical aspects, is able to plan and conduct experiments, including measurements and computer simulations, critically interprets the obtained results and draws conclusions. Is able to manage the work of a team.		Student is able to arrange and implement various experiments in the field of satellite imagery processing and analysis.			[SU3] Assessment of ability to use knowledge gained from the subject [SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools [SU2] Assessment of ability to analyse information			
	[K7_W06] Has well-ordered and extended knowledge on ICT in space and satellite engineering. Has well-ordered and extended knowledge about potential, methods and application areas of satellite remote sensing and Earth observation as well as about the structure of individual segments, principles of operation and applications of satellite navigation systems. [K7_K03] Can analyse and implement assigned tasks while maintaining high technical standards. Is able to work and interact in a group, taking on		Student has knowledge on applications of IT solutions in satellite imagery processing and analysis. Student implements assigned tasks on processing, analysis and utilising of satellite imagery while maintaining high technical standards.			[SW1] Assessment of factual knowledge [SK2] Assessment of progress of work [SK5] Assessment of ability to solve problems that arise in practice			
	principles of professional ethics and respects the diversity of views and cultures.								

Subject contents	Introduction to satellite technologies. Types of orbits of artificial Earth satellites, including Earth observation (EO) satellites. Satellite instrumentation components. Electromagnetic waves and their use in satellite imaging. Bands used in satellite remote sensing: visible, infrared, radar. Creation of satellite image. Technical features of satellite EO system. Review of present EO systems and programs, e.g. Landsat, SPOT, NOAA/MetOp, Sentinel. Sample applications of satellite remote sensing in land, sea and atmosphere observation. Satellite detection and sensing of hazards. Review of open and commercial software for satellite EO data processing. Sources and services of satellite imaging data and their processing products. Image processing stages. Preprocessing: radiometric and geometric correction, georeferencing. Processing and visualisation of an image: color modes and tables, true and false color visualisation, histogram processing, image algebra and indices (e.g. NDVI), spatial filtering, image classification, image interpolation.						
Prerequisites and co-requisites	Not defined.						
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade				
	Colloquia	50.0%	20.0%				
	Final exam	50.0%	30.0%				
	Practical exercises	50.0%	50.0%				
Recommended reading	Basic literature Supplementary literature	 Chuvieco E., Fundamentals of Satellite Remote Sensing: An environmental aproach, CRC Press, Taylor & Francis Group, 2016 Elachi C., Van Zyl J. J., Introduction to the Physics and Techniques of Remote Sensing, 2nd Edition, Wiley, 2006 Longley P., Goodchild M., Maguire D., Rhind D. "Geographic Information Systems and Science", John Wiley & Sons Ltd., West Sussex 2005 Richards J. "Remote Sensing Digital Image Analysis", Springer- Vergal Berlin Heidelberg 1986 and 1993 Maini A. K., Agrawal V., Satellite Technology: Principles and Applications, Second Edition, John Wiley & Sons, 2011 					
	eResources addresses	Adresy na platformie eNauczanie:					
Example issues/ example questions/ tasks being completed	Not specified.						
Work placement	Not applicable						

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