



Subject card

Subject name and code	Spatial Data Processing Technologies, E:41025W0						
Field of study	Space and Satellite Technologies						
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			English		
Semester of study	1	ECTS credits			2.0		
Learning profile		Assessment form			assessment		
Conducting unit	Department of Geoinformatics -> Faculty of Electronics, Telecommunications and Informatics						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Marcin Kulawiak				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	0.0	0.0	30
	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	30	0.0		0.0		30
Subject objectives	Acquisition of the knowledge and practical skills on technologies for spatial data acquisition, representation and processing						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	K7_W12	Student knows models and formats of spatial data and their applications as well as the architecture and functionality of modern GIS.			[SW1] Assessment of factual knowledge		
	K7_U12	Student is able to use and to implement various methods of processing and analysis of spatial data.			[SU1] Assessment of task fulfilment		
	[K7_K02] Understands the non-technical aspects of activities in the field of space and satellite technologies, including their social consequences and impact on the state of the environment. Expresses opinions on the development of technology and related risks.	He understands non-technical aspects of issues related to the management and processing of spatial data.			[SK2] Assessment of progress of work		
Subject contents	Introduction to GIS, definitions, basic functionality, data types and sources Popular GIS software (Quantum GIS, GRASS, ArcGIS, other) Standards for spatial data representation: shapefile, GML, KML, WMS, WFS, WCS, CSW GIS data sources: satellite Earth observation data, laser 3D scanning data Review of open technologies for spatial data processing (GeoTools, Geoserver, OpenLayers, GeoEXT, Nominatim, Routino, Google Maps API, Cesium), Raster and vector databases, SQL spatial extensions, vector data geoprocessing in geodatabases						
Prerequisites and co-requisites	Basic knowledge of the rules of programming						

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Lecture test	60.0%	50.0%
	Laboratory	60.0%	50.0%
Recommended reading	Basic literature	P. A. Longley, M. F. Goodchild, D. J. Maguire, D. W. Rhind: Geographic information systems and science. Wiley, 2004 S. Shekhar, H. Xiong, X. Zhou (ed.), Encyclopedia of GIS. Springer, 2017	
	Supplementary literature	Kulawiak, M., Kulawiak, M. and Lubniewski, Z., 2019. Integration, processing and dissemination of LiDAR data in a 3D web-GIS. <i>ISPRS International Journal of Geo-Information</i> , 8(3), p.144. Kulawiak, M. and Kulawiak, M., 2017. Application of Web-GIS for dissemination and 3D visualization of large-volume LIDAR data. In <i>The rise of big spatial data</i> (pp. 1-12). Springer International Publishing. Moszynski, M., Czarnul, P., Kulawiak, M., Bishop, M., Bielinski, T. and Dobreva, I., 2016, June. Application of Web-GIS and Cloud Computing to Automatic Satellite Image Correction. In <i>2016 Baltic Geodetic Congress (BGC Geomatics)</i> (pp. 51-55). IEEE.	
	eResources addresses	Adresy na platformie eNauczenie:	
Example issues/ example questions/ tasks being completed	Perform atmospheric correction of a given satellite image Classify the contents of a satellite image Georeference a given aerial photograph		
Work placement	Not applicable		