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 2025	Academic year of realisation of subject	2024/2025
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 -> Wydziały Politechniki Gdańskiej

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_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
	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_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

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
	Laboratory	60.0%	50.0%
	Lecture test	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. *ISPRS International Journal of Geo-Information*, *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 *The rise of big spatial data* (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 *2016 Baltic Geodetic Congress (BGC Geomatics)* (pp. 51-55). IEEE.
	eResources addresses	Adresy na platformie eNauczanie:

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

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