

表 GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	GIS METHODS IN DATA ANALYSIS, PG_00060821								
Field of study	Economic Analytics								
Date of commencement of studies	October 2023		Academic year of realisation of subject			2024/2025			
Education level	second-cycle studies		Subject group			Optional subject group Subject group related to scientific research in the field of study			
Mode of study	Full-time studies		Mode of delivery			at the university			
Year of study	2		Language of instruction			English			
Semester of study	3		ECTS credits			3.0			
Learning profile	general academic profile		Assessment form			exam			
Conducting unit	Katedra Statystyki i Ekonometrii -> Faculty of Management and Economics								
Name and surname	Subject supervisor		dr Marta Kuc-Czarnecka						
of lecturer (lecturers)	Teachers		dr Marta Kuc-Czarnecka						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Projec	t	Seminar	SUM	
	Number of study hours	15.0	0.0	30.0	0.0	0.0		45	
	E-learning hours included: 0.0								
Learning activity and number of study hours	Learning activity	Participation in classes includ plan	n didactic ed in study	Participation in consultation hours		Self-study		SUM	
	Number of study hours	45		3.0		27.0		75	
Subject objectives	Formulates research problems and select effective methods of solving them, using GIS methods in an in- depth way								
Learning outcomes	Course out	Subject outcome			Method of verification				
	[K7_W05] takes into account in the analyzes in an in-depth way both the economic, legal and ethical context, being aware of the responsibility for the consequences of its decisions		makes responsible business decisions based on the results of analyzes using modern GIS tools and their possible applications in spatial analytics			[SW1] Assessment of factual knowledge			
	[K7_U03] formulates research problems and selects appropriate analytical methods for their effective solution, using advanced IT tools, and evaluates the results critically		design research supporting business decision-making processes, using in practice GIS tools to support business decisions			[SU3] Assessment of ability to use knowledge gained from the subject			
Subject contents	Basic concepts of GIS Different data sources in GIS: vector, raster and attribute-based. Public sources of GIS data Applications of GIS in scientific research and business Coordinate systems and map projections Spatial data acquisition Spatial measures of central tendency and variation (central mean, central median, standard distance, directional distribution) Vector data model - introduction, applications, basic functions. Raster data model - introduction, applications, basic functions Numerical terrain model Spatial neighborhood - statistics: Moran I, Local Moran I, Getis-Ord General, Getis-Ord Gi* Spatial modeling and interpolation - prespace weighted regression, IDW, kriging Network analysis Optimal localization problem, comovement problem, Chinese letter carrier problem Modelbuilder and Python in ArcGIS pro Application of spatial methods to real estate market analysis, crime, customer segmentation								
Prerequisites and co-requisites									

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade		
	Test	60.0%	30.0%		
		60.0%	70.0%		
Recommended reading	Basic literature	Urbański, J. (2020) STO stron GIS, Wydawnictwo Uniwersytetu Gdańskiego Iwańczak, B. (2012) QGIS 3.14 Tworzenie i analiza map, Helion Longley P.A. (2008) GIS. Teoria i praktyka, PWN			
	Supplementary literature	Pimpler, E. (2017). Spatial Analytics with ArcGIS Malczewski, J., Jaroszewicz J. (2018). Podstawy analiz wielokryterialnych w Systemach Informacji Geograficznej, Wydawnictwo Politechniki Warszawskiej Szulc, E., Jankiewicz, M. (2022). Statystyczna i ekonometryczna analiza przestrzennych zjawisk ekonomicznych. Metody i zastosowania			
	eResources addresses	Adresy na platformie eNauczanie:			
Example issues/ example questions/ tasks being completed	For each city with less than 2,000 inhabitants in the selected poviat, assign the type of land cover with the largest area within a radius of 2 km Designate areas in the selected city that are more than 3 km from the nearest BTS What elements define the horizontal frame of reference? Describe one type of cartographic projection of your choice Estimate a spatial regression model for real estate prices in a selected commune				
Work placement	Not applicable				