Subject card

Subject name and code	MULTI-DIMENSIONAL DATA ANALYSIS, PG_00066368					
Field of study	Economic Analytics					
Date of commencement of studies	October 2024		Academic year of realisation of subject		2025/2026	
Education level	second-cycle studies		Subject group		Optional subject group Specialty subject group Subject group related to scientific research in the field of study	
Mode of study	Part-time studies		Mode of delivery		at the university	
Year of study	2		Language of instruction		Polish	
Semester of study	3		ECTS credits		4.0	
Learning profile	general academic profile		Assessment form		exam	
Conducting unit	Department of Statistics and Econometrics -> Faculty of Management and Economics					
Name and surname of lecturer (lecturers)	Subject supervisor		dr Marta Kuc-Czarnecka			
	Teachers		dr Marta Kuc-Czarnecka			

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	8.0	0.0	16.0	0.0	0.0	24
	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	24	4.0	72.0	100

Subject objectives	Presents effective solutions to multidimensional research problems using information from many sources, selecting appropriate methods of data preparation and processing

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K7_W03] Demonstrates in-depth knowledge of the applications of analytical methods and techniques for formulating and solving analytical problems	creates models of multidimensional economic phenomena using advanced methods of data preparation and processing methods, according to a specific research goal	[SW1] Assessment of factual knowledge
	[K7_U01] Develops innovative solutions for complex and unstructured processes, considering unpredictable environmental conditions by synthesizing information from multiple sources	integrates information from many sources to obtain innovative solutions to complex socio-economic and business problems	[SU2] Assessment of ability to analyse information

Subject contents	Fundamentals of Multivariate Statistical Analysis (MSA) Databases. Eurostat, OECD, World Bank and ILO as the main source of data for multivariate analysis Possibilities of using MSA for socio-economic and business analysis Selection of diagnostic variables, similarity measures Stimulation and normalization of variables, weighting of variables Methodology for creating composite indicators Sensitivity analysis as a tool for evaluating composite indicators Linear ordering of objects, measures of similarity of rankings Shapley value, Balinski-Young method, Borda method, Condorcet efficiency Quantitative storytelling Taskonomic grouping - k-means method, silhouette index Ward's hierarchical agglomerative grouping method Selection of representatives of groups of spatial objects Principal component analysis Factor analysis Correspondence analysis
Prerequisites and co-requisites	

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Test	60.0%	30.0%
	Exam	60.0%	70.0%
Recommended reading	Basic literature	Walesiak, M., Gatnar, E (2009). Statystyczna analiza danych z wykorzystaniem programu R Panek, T. Zwierzchowski, J. (2013). Statystyczne metody wielowymiarowej analizy porównawczej. Teoria i zastosowania Pawełek, B. (2008). Metody normalizacji zmiennych w badaniach porównawczych złożonych zjawisk ekonomicznych	
	Supplementary literature	Młodak A., (2006). Analiza taksonomiczna w statystyce regionalnej Kukuła K. (2000). Metoda unitaryzacji zerowanej	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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