



## Subject card

Subject name and code	MULTI-DIMENSIONAL DATA ANALYSIS, PG_00061090						
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		4.0		
Learning profile	general academic profile		Assessment form		exam		
Conducting unit	Katedra Statystyki i Ekonometrii -> 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	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 didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	Number of study hours	45		11.0		44.0	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 preparation in the application of analytical methods and techniques for formulating and solving 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] creates innovative solutions to complex and unstructured problems, taking into account the variability of the environment by synthesising information from many sources		integrates information from many sources to obtain innovative solutions to complex socio-economic and business problems		[SU3] Assessment of ability to use knowledge gained from the subject		
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
	Exam	60.0%	70.0%
	Test	60.0%	30.0%
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		