

Subject card

Subject name and code	Statistical Decision Analysis, PG_00156331						
Field of study	Informatics and Econometrics						
Date of commencement of studies	October 2024		Academic year of realisation of subject		2024/2025		
Education level	Master's studies		Subject group		Obligatory subject group in the field of study		
Mode of study	part-time studies		Mode of delivery		at the university		
Year of study	1		Language of instruction		Polish		
Semester of study	1		ECTS credits		3.0		
Learning profile	academic		Assessment form		credit		
Conducting unit	Department of Statistics -> Faculty of Management -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Arkadiusz Kozłowski				
	Teachers		dr Arkadiusz Kozłowski				
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	8.0	0.0	14.0	0.0	0.0	22
	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	22		0.0		0.0	22
Subject objectives	Developing the ability to use statistical tools in the decision-making process.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[liEMU2_U07] The student is able to build advanced formal models of complex economic phenomena and processes, estimate them, carry out their verification and apply them to modeling, forecasting and optimization of resources of economic institutions of varying degrees of complexity, their structure and the course of processes in them.		The student is able to select the appropriate estimation method for the examined issue		[SU1] oral statement/conversation/discussion		
	[liEMU2_K01] The student understands the need for continuous completion and deepening of acquired knowledge. The student inspires and organizes others' learning processes.		The student knows how to acquire knowledge about statistical decision analysis		[SK4] test/exam - oral or written		
	[liEMU2_W04] The student has an in-depth knowledge of advanced mathematical, statistical, econometric and IT methods that enable the acquisition, processing and analysis of data reflecting the functioning and growth of the national economy and its components, as well as the phenomena and processes occurring in their environment.		The student is able to perform statistical inference based on a random sample of units.		[SW4] test/exam - oral or written		

Subject contents	1. Random variables and selected probability distributions used in statistical inference. Simple random sample. Distributions of selected statistics from the sample. 2. Classical estimation: Estimators and their properties. Methods for determining estimators: method of moments, maximum likelihood method. 3. Bayesian decision making: Bayes' theorem. Sample distribution. Determining the a priori distribution (informative and non-informative distributions, quantification of subjective beliefs). Determining the posterior distribution. 4. Bayesian estimation: Features of Bayesian inference. Bayesian point estimation for selected loss functions. Bayesian interval estimation. 5. Classic hypothesis testing: The essence of hypothesis testing. The relationship between type I and type II error. Significance level and critical area, test probability (p-value). The concept of test power. 6. Selected parametric and non-parametric tests (including permutation tests).		
Prerequisites and co-requisites	Knowledge of descriptive statistics methods.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	test	51.0%	100.0%
Recommended reading	Basic literature	1. Aczel A. D., Statystyka w zarządzaniu, PWN, Warszawa 2000; 2. Balicki A., Metody wnioskowania statystycznego, Wydawnictwo Uniwersytetu Gdańskiego, Gdańsk 2004; 3. Gajek L., Kałuska M., Metody wnioskowania statystycznego, WNT, Warszawa 2000; 4. Kończak G., Testy permutacyjne. Teoria i zastosowania. Wydawnictwo Uniwersytetu Ekonomicznego w Katowicach, Katowice 2016; 5. Kozłowski A., Szreder M., Informacje spoza proby w badaniach statystycznych, Wydawnictwo Uniwersytetu Gdańskiego, Gdańsk 2020.	
	Supplementary literature	1. Osiewalski J., Ekonometria Bayesowska w zastosowaniach, Wyd. Akademii Ekonomicznej w Krakowie, Kwaków, 2001. 2. Stanisław A., Przystępny kurs statystyki z zastosowaniem STATISTICA.PL na przykładach z medycyny. Tom 2, Modele liniowe i nieliniowe, StatSoft, Kraków 2007. 3. Szreder M., Informacje a priori w klasycznej i bayesowskiej estymacji modeli regresji, Wydawnictwo UG, Gdańsk 1994.	
	eResources addresses		
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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