Subject card

Subject name and code	STATISTICS II, PG_00044549					
Field of study	Management					
Date of commencement of studies	October 2022		Academic year of realisation of subject		2022/2023	
Education level	second-cycle studies		Subject group		Obligatory subject group in the field of study	
					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	1		Language of instruction		English	
Semester of study	2		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			
			dr Olgun Aydin			

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	8.0	47.0	100

Subject objectives	The aim of the course is to acquaint students with the basic concepts and methods of the probability calculus and the statistical inference in order to enable analysis and interpretation of the results. Emphasis is put on understanding the concepts and linking the mathematical models with the real processes and phenomena, mainly in the domain of economics.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K7_U02] analyses complex economic processes and phenomena using selected methods and techniques for analysing socio-economic data, and formulates their own opinions and conclusions concerning these processes and phenomena	The student is able to select the sample, assess its character, and then choose appropriate statistical techniques in order to assess the significance of the parameter (parametric test) and distribution (nonparametric test). The student can also perform tests based on the data from multiple populations.	[SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools
	[K7_W07] knows in depth selected methods and techniques of data acquisition, enabling analysis and modelling of structures and socio-economic relations, processes taking place and their impact on the implementation of objectives of the organization, including government administration, local government and non-profit organizations	The student knows the classical probability distributions and their properties, knows the basic structure of estimators and test statistics as well as the methods of their estimation. The student has a basic knowledge of modelling random variables and the use of probabilistic models.	[SW1] Assessment of factual knowledge
	[K7_U04] models and forecasts socio-economic processes using advanced quantitative and qualitative methods	The student identifies and evaluates the company management processes according to the applications of correlation coefficients and regressions.	[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools
	[K7_U10] uses appropriate methods and techniques to support the decision-making process to solve problems occurring in livestock units	The student is able to apply the basic methods of probability calculus and mathematical statistics to solve theoretical and practical problems in various areas of management.	[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools

Subject contents	Definitions of probability and its properties. Basic rules of calculation of probabilities, Bayes' theorem. Random variables, parameters of distributions. Discrete distributions (including binomial and Poisson) and continuous distributions (uniform and normal). Populations and samples, sampling distributions and statistics, estimators. Confidence intervals for proportions and means. Determining the sample size. Hypothesis testing. Inferences based on a single sample (mean, proportion). Inferences based on two samples (means, proportions). ANOVA, 2-way Anova with interactions. Chi-square tests. Nonparametric tests. Kernel PDF and CDF estimation. Statistical testing in correlation analysis. OLS and linear regression. Problem of endogeneity and estimation with instrumental variables. Maximum likelihood approach. Linear models for panel data.

Prerequisites and co-requisites	basic concepts of descriptive statistics and the theory of probability

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Final (oral) exam (lecture)	60.0%	50.0%
	Midterm and final tests (labs)	60.0%	50.0%

Recommended reading	Basic literature	1. McClave J.T., Benson P.G., Sincich T. (2008), Statistics for Business and Economics, Pearson/Prentice Hall. 2. Aczel A.D. (1989), Complete Business Statistics, Irwin.
	Supplementary literature	3. Newbold P., Carlson W.L., Thorne B.M., Statistics for Business and Economics, Pearson. 4. Miller I., Miller M., John E. Freund's mathematical statistics with applications, Pearson/Prentice Hall. 5. Wackerly D., Mendenhall W., Scheaffer R.L., Mathematical statistics with applications, Thomson Brooks/Cole.
	eResources addresses	Podstawowe https://enauczanie.pg.edu.pl/moodle/course/view.php?id=27755 - Statistics II - lecture - lecture notes and additional materials Adresy na platformie eNauczanie: Statistics II - lecture - Moodle ID: 27755 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=27755 Statistics II - lecture - Moodle ID: 27755 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=27755

Example issues/ example questions/ tasks being completed	

Work placement	Not applicable