GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	ESSENTIALS OF STATISTICS, PG_00061163		
Field of study	Management		
Date of commencement of studies	October 2023	Academic year of realisation of subject	2023/2024
Education level	first-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	1	ECTS credits	5.0
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 Olgun Aydin	
	Teachers	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	72.0	125

Subject objectives

Selects an appropriate methodology for testing regularities occurring in mass processes, using statistical software to process data and interpret obtained results

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W02] demonstrates comprehensive preparation in terms of methods, techniques for formulating and solving problems	formulates the problem appropriately, obtains the data, selects methods necessary for solving the given problem, and interprets the results correctly	[SW1] Assessment of factual knowledge
[K6_U07] uses information technology to improve data analysis and decision-making processes	uses statistical software that facilitates the analysis of mass data and supports decision-making processes	[SU4] Assessment of ability to use methods and tools

Subject contents

Elements of probability calculus. The concept and the way of representing the distribution of features
Location measures: arithmetic mean, geometric mean, mode, median, quartiles)
Dispersion measures (variance, standard deviation, coefficient of variation, quartile range)
Distribution asymmetry and flattening, asymmetry measures (relative moment three, quartile skewness), flattening measure (relative moment four, kurtosis)
Two-dimensional analysis of random variables; analysis of interdependencies between quantitative features (correlation, Pearson's linear correlation coefficient, linear regression: function parameters, fit measures)
Analysis of interdependencies between qualitative features (rank correlation coefficients, contingency coefficients)
Index account (individual and aggregate price, quantity and value Laspeyres, Paasche and Fisher indices, single-base and chain indices)
Elements of descriptive analysis of a time series (linear and non-linear trend function, relative and absolute periodic fluctuations, calculated in relation to the average value of the phenomenon and the trend level, random fluctuations)
The expected value, variance, and standard deviation of a random step variable
Selected distributions of step variables (dummy, binomial, Poisson distribution)
Continuous random variable, the concept of probability density function
Normal distribution, standardization of a normal random variable

Prerequisites and co-requisites

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Test (laboratory)	50.0%	50.0%
	Exam	50.0%	50.0%
Recommended reading	Basic literature	Aczel A.D. (1989), Complete Business Statistics, Irwin Freund J.E., R.E. Walpole (1987), Mathematical Statistics, Prentice-Hall, (4th edition) Gudmund R., Iversen Mary G.(1997). Statistics. The Conceptual Approach. Springer, New York, NY Mendenhal W. l, D.D. Wackerly (2007), Mathematical Statistics with Applications, Thomson Learning (7th edition) Othmar W. Winkler, (2009). Interpreting Economic and Social Data. A Foundation of Descriptive Statistics. Springer, Berlin, Heidelberg Wasserman, L. (2004). All of Statistics, A Concise Course in Statistical Inference. Springer, New York, NY	
	Supplementary literature	Greń J., Statystyka matematyczna - modele i zadania, PWN, Warszawa, 1999 lub wydania późniejsze Fisz M., Rachunek prawdopodobieństwa i statystyka matematyczna, PWN, Warszawa 1969 Kot S.M., Sokołowski A., Jakubowski J., Statystyka, Difin, Warszawa, 2007 Krysicki W, J. Bartos, W. Dyczka, K. Królikowska, M. Wasilewski, Rachunek prawdopodobieństwa i statystyka matematyczna w zadaniach, część II, PWN, Warszawa 1986	
	eResources addresses	Adresy na platformie eNauczanie: Essentials of Statistics - 2023/24 - Moodle ID: 34121 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=34121	
Example issues/ example questions/ tasks being completed	Task During tests on the test stand, the basic parameters of the engine of a randomly selected car leaving the production line are determined. The amount of fuel burnt on the basis of tests of manufactured cars had a normal distribution with an average of 6.5 liters/100 km and a variance of 2.4 liters/100 km. If the fuel consumption variance of a randomly selected car exceeds 2.7 liters / 100 km, the car is directed to replace the engine fuel system Calculate what percentage of cars return to improvement Calculate the percentage of cars within a range of plus/minus 75% of the standard deviation from the mean Questions: What is feature distribution? What is time series decomposition? List and describe the components of a time series State the central limit theorem		
Work placement	Not applicable		

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