GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	ESSENTIALS OF STATISTICS, PG_00058545		
Field of study	Economic Analytics		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2024/2025
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	Part-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	Polish
Semester of study	1	ECTS credits	5.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Faculty of Management and Economics		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Agnieszka Wałachowska	
	Teachers	dr inż. Agnieszka Wałachowska	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	16.0	0.0	16.0	0.0	0.0	32

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	32	10.0	83.0	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_U07] Applies advanced information technologies to enhance 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 [SU1] Assessment of task fulfilment
[K6_W02] Demonstrates advanced knowledge of methods and techniques related to the field of study in economic analytics to explain complex problems.	formulates the problem appropriately, obtains the data, selects methods necessary for solving the given problem, and interprets the results correctly.	[SW3] Assessment of knowledge contained in written work and projects

Subject contents	Population and sample Full and partial tests Random and non-random selection methods Classification of statistical characteristics The concept of a random variable and basic information about distributions (discrete, continuous) Importance of measures of central tendency Differences between classic and positional measures Arithmetic mean, harmonic mean, median, dominant, quartiles, percentiles Importance of measures of variation Variance, standard deviation, coefficient of variation, quadrant deviation, positional coefficient of variation, range, decile range Box-and-whisker plot Importance of asymmetry measures Third central moment, asymmetry coefficient, positional asymmetry coefficient Examples of asymmetric distributions Importance of measures of distribution flattening Fourth central moment, kurtosis, positional concentration coefficient Statistical series Histogram Distributor Central Limit Theorem

Verification of statistical hypotheses introductory information

Type I and II error

Test significance level

Practical applications of correlation analysis

Apparent correlation

Functional dependence and stochastic dependence

Covariance, Pearson's linear correlation coefficient, Spearman's rank correlation coefficient, Kendall's tau coefficient, gamma coefficient, Pearson's correlation relations

Scatterplot

Practical applications of the analysis of the interdependence of quality features

Contingency tables

Chi-square test of independence

V-Cramer coefficient,

Difference between correlation and regression analysis

Practical applications of regression analysis

Introduction to modeling simple regression and multiple (linear) regression

The main assumptions of KMNK

Assessment of the significance of parameters

Measures of the accuracy of the estimated model

Analysis of the dynamics of phenomena

Increments and individual indexes

Aggregate price and quantity indices (Laspeyres, Paasche, Fisher)

	Time series Time series of periods and moments Time series components (trend, seasonal, cyclical and random fluctuations) Trend extraction (mechanical and analytical method) Simple moving average Exponential smoothing Modern methods of data visualization Errors in test preparation Errors in conducting the study Errors in the preparation of research results Inference errors
Prerequisites and co-requisites	

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Tutorial exam	60.0%	50.0%
Written exam	60.0%	50.0%

Recommended reading

Basic literature	Barrow, M. (2017), Statistics for Economics, Accounting and Business Studies, Harlow: Prentice Hall. Newbold, P., Carlson, W.L., Thorne, B. (2019). Statistics for Business and Economics, New York: Pearson Education.
Supplementary literature	Anderson D. (2019), Essentials Of Statistics For Business & Economics, Cengage Learning Bąk I.,Markiewicz I., Mojsiewicz M., Wawrzyniak K. (2021), Formulas and tables Statistical and econometric methods, CeDeWu

	eResources addresses	Adresy na platformie eNauczanie: Podstawy statystyki WYKŁAD - Moodle ID: 40146 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=40146 Podstawy statystyki - laboratorium AG - Moodle ID: 40078 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=40078
Example issues/ example questions/ tasks being completed	Explain the difference between random and convenient selection. Describe briefly the measurement theory. Make a complex structure analysis of the households income in the Pomeranian Voivodeship in 2020. Check if there is a correlation between gender and consumer behaviour. On the basis of the data from the "Exam" file, calculate and interpret the dynamic measures of emigration in Poland. Was the pace of change higher in 1990-2000 or 2000-2010? Justify your answer. Based on the data from the "Exam" file, estimate the regression function for TFR using unemployment as a regressor. Write down the estimated model in the form of an equation. Interpret the structural parameters of the model and the goodness-of-fit measures. Does the estimated model fit well with the real data? Justify your answer.	
Work placement	Not applicable	

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