



Subject card

Subject name and code	ESSENTIALS OF STATISTICS, PG_00067164						
Field of study	Economics						
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	Full-time studies		Mode of delivery		blended-learning		
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	Department Of Statistics And Econometrics -> Faculty Of Management And Economics -> Wydziały Politechniki Gdańskiej						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Agnieszka Wałachowska				
	Teachers		dr inż. Agnieszka Wałachowska dr inż. Krzysztof Świetlik dr Jarosław Krajewski Olga Komorowska				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	30.0	0.0	0.0	60
	E-learning hours included: 30.0						
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	60		10.0		55.0	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 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		[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools		
	[K6_W02] demonstrates comprehensive preparation in methods and 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		[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)

	<p>Time series</p> <p>Time series of periods and moments</p> <p>Time series components (trend, seasonal, cyclical and random fluctuations)</p> <p>Trend extraction (mechanical and analytical method)</p> <p>Simple moving average</p> <p>Exponential smoothing</p> <p>Modern methods of data visualization</p> <p>Errors in test preparation</p> <p>Errors in conducting the study</p> <p>Errors in the preparation of research results</p> <p>Inference errors</p>		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	written exam	60.0%	50.0%
	tutorial exam II	60.0%	50.0%
Recommended reading	Basic literature		
	<p>Barrow, M. (2017), Statistics for Economics, Accounting and Business Studies, Harlow: Prentice Hall.</p> <p>Newbold, P., Carlson, W.L., Thorne, B. (2019). Statistics for Business and Economics, New York: Pearson Education.</p>		

	Supplementary literature	<p>Anderson D. (2019), Essentials Of Statistics For Business & Economics, Cengage Learning</p> <p>Bąk I., Markiewicz I., Mojsiewicz M., Wawrzyniak K. (2021), Formulas and tables Statistical and econometric methods, CeDeWu</p>
	eResources addresses	<p>Podstawowe</p> <p>https://enauczanie.pg.edu.pl/moodle/course/view.php?id=40142 -</p> <p>https://enauczanie.pg.edu.pl/moodle/course/view.php?id=39587 -</p> <p>Adresy na platformie eNauczanie:</p>
Example issues/ example questions/ tasks being completed	<p>What is a statistical feature? Provide types of features and examples.</p> <p>The concept of general population and samples.</p> <p>Calculation and interpretation of basic descriptive measures of distribution.</p> <p>Knowledge of basic distributions of a random variable.</p> <p>Correlation coefficient (calculation method, interpretation).</p> <p>Assumptions of the Classical Linear Regression Model (KMRL).</p> <p>Time series components, trend analysis, measurement of seasonal fluctuations.</p> <p>Simple methods of examining the dynamics of economic phenomena, absolute growth, relative growth.</p>	
Work placement	Not applicable	

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