University of Gdańsk

Subject card

Subject name and code	Mathematics and Statistics - lecture II, PG_00091507						
Field of study	Water Management and Protection of Water Resources						
Date of commencement of studies	October 2024		Academic year of realisation of subject		2024/2025		
Education level	undergraduate studies		Subject group		Obligatory subject group in the field of study Subject group related to practical vocational preparation		
Mode of study	full-time studies		Mode of delivery		at the university		
Year of study	1		Language of instruction		Polish		
Semester of study	2		ECTS credits		1.0		
Learning profile	practical		Assessment form				
Conducting unit	Pracownia Biologii Planktonu -> Katedra Biologii Morza i Biotechnologii -> Faculty of Oceanography and Geography						
Name and surname of lecturer (lecturers)	Subject supervisor		prof. dr hab. Mirosław Miętus				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	0.0	0.0	15
	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	15		5.0		10.0	30
Subject objectives	The lectures will provide basic knowledge of the fundamentals of descriptive statistics to a degree that allows you to understand the content of the lectures given in the further course of study, as well as allow you to perform the calculations necessary to carry out the tasks of a specialist in water management and protection.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[GWOZWL3-W02] the importance of knowledge in the sciences allowing to understand the processes and phenomena occurring in the hydrosphere, as well as knowledge of the social sciences and of the Earth's geographic environment - as a a system of interrelated and interacting components	K_W02 - Knows the importance of knowledge of statistics to understand the processes and phenomena occurring in water.	[SW4] test/exam - oral or written
[GWOZWL3-K03] systematic further education and professional development, updating and expand their knowledge and skills, understands the limitations of his own knowledge in the context of civilization progress and recognizes authorities in the professional and scientific environment	K_K03 - Systematically continues education and improves professionally, expands his knowledge and skills in statistics, understands the limitations of his own knowledge in the context of civilization progress and recognizes authorities in the professional and scientific environment	[SK4] test/exam - oral or written
[GWOZWL3-U08] use basic mathematical and statistical methods to analyze data and describe phenomena and processes occurring in the environment, as well as methods of information technology to assess the risk of threats to the of the environment, especially the hydrosphere	K_U08 - Knows how to use basic statistical methods to analyze data and describe phenomena and processes in the environment	[SU4] test/exam - oral or written
[GWOZWL3-W04] research techniques, methods and tools currently used in water management and protection of water resources both in the field of natural sciences and social sciences, including basic statistical and information technology tools that make it possible to describe, model and interpret data on phenomena and processes occurring in the aquatic environment, as well as tools for describing relationships in social-ecological systems	K_W04 - Knows basic statistical tools to describe and interpret data on phenomena and processes	[SW4] test/exam - oral or written

Subject contents

1 Introductory issues - Concept and methods of statistics, applications of statistics; Stages of statistical investigation; Basic terminology; Measurement scales. 2 Preparation and transformation of data; Descriptive statistics: measures of central tendency. 3 Measures of dispersion, Trait and probability distributions 4. verification of statistical hypotheses (formulation of hypotheses, level of significance, types of statistical tests); Interval estimation 5. multivariate tables, frequency analysis; Two-sample tests 6 Linear regression (estimation and interpretation of function parameters, evaluation of fit, testing significance of regression coefficient) and correlation (Pearson's linear correlation coefficient and testing its significance; Spearman's rank correlation coefficient and testing its significance); Estimation and interpretation of trend function parameters; Multiple regression 7 Introduction to multivariate analysis; Interpretation of ordination charts and classification trees; Presentation of data: series, tables, graphs
Translated with DeepL.com (free version)

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
test	51.0%	100.0%

Recommended reading

Basic literature

Makać W., Urbanek-Krzysztofiak D., 2004. methods of statistical description. Wyd. UG, Gdańsk, (in Polish)
Balicki A., Makać W., 2010, Methods of statistical inference, Wyd. UG, Gdańsk, (in Polish)

	Supplementary literature	Krysicki w., Bartos J., Dyczka W., Królikowska K., Wasilewski M., 1986 Probability calculus and mathematical statistics in tasks. Part II. Mathematical statistics, PWN,(in Polish)
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	1. The study calculated the values of the mean (10.4), median (12.6) and dominant (15.0). Determine the type of asymmetry of the distribution. 2. Determine the minimum sample size if =6, and the expected precision of 2 at the 0.05 significance level (z=0.05=1.96).3. The watercourse flows in the closure profile have a normal distribution with a mean of 120 m3/s and a standard deviation of 20 m3/s. Calculate the probability that the flows in this watercourse will have values in the range of 90-150 m3/s.	
Work placement	Not applicable	

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