University of Gdańsk

Subject card

Subject name and code	Statistical methods in geology - exercises, PG_00121005		
Field of study	Geology		
Date of commencement of studies	October 2025	Academic year of realisation of subject	2025/2026
Education level	Bachelor's studies	Subject group	
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	academic	Assessment form	credit
Conducting unit	Laboratory of Geomorphological Reconstructions -> Department of Geomorphology and Quaternary Geology -> Faculty of Oceanography and Geography -> Rector		
Name and surname of lecturer (lecturers)	Subject supervisor	dr Damian Moskalewicz	
	Teachers		

Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	15.0	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	12.0	13.0	40

Subject objectives	Exercises: acquiring the ability to perform selected statistical analyzes used in geology, as well as presenting and interpreting research results (e.g. basic measures and descriptive statistics, hypothesis testing, analysis of variance, correlations, regressions, PCA, cluster analysis, LDA, statistical stratigraphic and lithological analyzes , data visualization)

Learning outcomes

Course outcome	Subject outcome	Method of verification
[GEOLL3_W02] knows and understands the terminology appropriate in science and natural sciences	knows and understands the appropriate terminology in the field of statistical methods used in geology	[SW3] text preparation/written work [SW5] implementation of a problem task
[GEOLL3_U04] is able to use specialized computer software and mathematical and statistical methods in the analysis of geological data	is able to use specialized computer software and mathematical and statistical methods in the analysis of geological data	[SU3] text preparation/written work [SU5] implementation of a problem task [SU6] demonstration of practical skills [SU8] observation of student's independent or team work
[GEOLL3_U02] has the skill of analytical and synthetic way of reasoning leading to correct inference based on the results obtained or the facts presented	has the ability to use analytical and synthetic reasoning leading to correct conclusions based on the results of geological research	[SU3] text preparation/written work [SU5] implementation of a problem task [SU6] demonstration of practical skills [SU8] observation of student's independent or team work
[GEOLL3_K03] is willing to exercise caution and criticism in receiving information from scientific literature, the Internet and other media related to natural sciences	is ready to be cautious and critical in accepting information from scientific literature, the Internet and other media relating to natural sciences in the field of statistics	[SK3] text preparation/written work [SK5] implementation of a problem task [SK8] observation of student's independent or team work
[GEOLL3_W06] knows statistical and IT tools as well as the principles of preparing engineering and geological documentation and cartographic materials	knows statistical and IT tools and the principles of preparing geological and engineering documentation and studies of cartographic materials	[SW3] text preparation/written work [SW5] implementation of a problem task

Subject contents

Laboratory exercises in the computer lab:B1. Descriptive statisticsB2. Data visualizationB3. Hypothesis testing and analysis of varianceB4. Correlations and regressionsB5. PCA, cluster analysis, LDAB6. Statistical stratigraphic and lithological analyses

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
report on performed tasks	51.0%	100.0%

Recommended reading

Basic literature

Davis, J.C., 2002. Statistics and data analysis in geology. Wiley & Sons.

Krysicki, W., Bartos, J., Dyczka, W., Królikowska, K., Wasilewski, M., 2011. Rachunek prawdopodobieństwa i statystyka matematyczna w zadaniach. Cz. 1 i 2. Wyd. PWN

Supplementary literature

Koronacki, J., Mielniczuk, J., 2009. Statystyka dla studentów kierunków technicznych i przyrodniczych. Wyd. Naukowo-techniczne.

Łomnicki, A., 2014. Wprowadzenie do statystyki dla przyrodników. Wyd. PWN

Biecek, P., 2017. Przewodnik po pakiecie R. Oficyna Wydawnicza GiS

Biecek, P., 2014. Analiza danych z programem R. Modele liniowe z efektami stałymi, losowymi i mieszanymi. Wyd. PWN

Gaetan, C., Guyon, X., 2010. Spatial Statistics and Modelling. Springer.

Healy, K., 2018. Data Visualization: A Practical Introduction. Princeton University Press

eResources addresses

Example issues/ example questions/ tasks being completed	CLA, PCA, LDA
Work placement	Not applicable

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