University of Gdańsk

Subject card

Subject name and code	Statistics for Oceanographers - laboratory, PG_00206136		
Field of study	Oceanography		
Date of commencement of studies	October 2027	Academic year of realisation of subject	2028/2029
Education level	Bachelor's studies	Subject group	Obligatory subject group in the field of study Optional subject group
Mode of study	full-time studies	Mode of delivery	at the university
Year of study	2	Language of instruction	Polish
Semester of study	3	ECTS credits	2.0
Learning profile	academic	Assessment form	credit
Conducting unit	Laboratory of Physical Oceanography -> Department of Physical Oceanography and Climate Research -> Faculty of Oceanography and Geography -> Rector		
Name and surname of lecturer (lecturers)	Subject supervisor	dr Jordan Badur	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	0.0	0.0	30.0	0.0	0.0	30

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	30	2.0	18.0	50

Subject objectives

The course aims to:

- develop the skills required for the proficient use of basic statistical terminology and statistical software in the natural sciences.
- develop the ability to interpret data and research findings.
- instruct on the use of statistical methods in oceanography.

The statistical methods introduced in this course will provide a foundation for the comprehensive study of advanced statistical techniques covered in subsequent specialized courses.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[OCEANL3-U05] is able to use general-purpose and specialized software, as well as mathematical and statistical methods, in data analysis and the presentation of results	Students are able to apply their statistical knowledge to solve both routine assignments and complex, non-standard problems in oceanography by employing appropriate statistical techniques and software tools.	[SU4] test/exam - oral or written
[OCEANL3-K03] is ready to exercise caution and criticism in accepting information from scientific literature, the Internet and other media relating to natural sciences	Students are prepared to independently determine the suitability of the presented statistical methods and to critically evaluate the results obtained from statistical research.	[SK4] test/exam - oral or written [SK5] implementation of a problem task
[OCEANL3-W05] has an advanced knowledge of techniques, research methods, and tools (mathematical, statistical, and computational) used by oceanographers to describe and interpret processes and phenomena occurring in the marine environment	Students will gain advanced understanding of the essential techniques and tools for the statistical analysis of processes and phenomena in marine environment, as well as the interconnections among objects, facts, processes, and phenomena within marine environment.	[SW4] test/exam - oral or written [SW5] implementation of a problem task

Subject contents

1. Data organisation, graphical presentation of data
2. Descriptive statistics: forming and interpretation of frequency series, contingency tables, histograms; descriptive statistics of empirical distributions
3. Random variables and their probability distribution,
4. Confidence intervals for expected values and proportion; determination of smallest sample necessary for a specified uncertainty.
5. Introduction to statistical testing: normality tests, t-Students test, non-parametric tests, tests for two populations.
6. Regression and correlation analysis

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Classroom assignments	51.0%	10.0%
Test	51.0%	90.0%

Recommended reading

Basic literature	• Łomnicki A., Introduction to statistics for nauturalists (in Polish). PWN Warszawa, 2003. • Rabiej M., Statistical analyses using Statistica and Excel (in Polish). Helion, 2018. • Rabiej M., Statistics with STATISTICA (in Polish). Helion, 2012. • Meissner W., Statistical methods in biology. Laboratory course guide (in Polish). Wydawnictwo Uniwersytetu Gdańskiego, 2014. • Górecki T., Elements of statistics with examples in R (in Polish), Wydawnictwo BTC, Legionowo, 2011.
Supplementary literature	• Kala R., Statistics for naturalists (in Polish). Wyd. AR Poznań, 2002 • Stanisz A., A simple statistics course using STATISTICA PL software based on examples in medicine, Vol. 1 (in Polish) StatSoft, 2006 • Sobczyk M., Statistics - theoretical foundations, examples, assignments (in Polish), Wydawnictwo UMCS, Lublin, 2003 • Koronacki J., Mielniczuk J., Statistics for engineering and science students (in Polish), PWN, Warszawa, 2018 • Kot S., Sokołowski A., Jakubowski J., Statistics, 2nd Ed, (in Polish), PWN, Warszawa, 2011
eResources addresses	

Example issues/ example questions/ tasks being completed

Determine the confidence interval for mean value, variance, proportion

Formulate and test relavant hypothesis for testing one or two mean values (variances)

Work placement

Not applicable

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