University of Gdańsk

Subject card

Subject name and code	Study Planning and Data Analysis - lecture, PG_00204961		
Field of study	Oceanography		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2026/2027
Education level	Master's studies	Subject group	Obligatory subject group in the field of study Optional subject group Subject group related to scientific research in the field of study
Mode of study	full-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	Polish
Semester of study	1	ECTS credits	1.0
Learning profile	academic	Assessment form	exam
Conducting unit	Faculty of Oceanography and Geography -> Rector		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. Bożena Graca, prof. UG	
	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	1.0	9.0	25

Subject objectives

To familiarise the student with the principles of planning experiments and field studies of the marine environment and the statistical processing of the results obtained.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[OCEANMU2-W05] knows and understands the principles of planning and conducting field and laboratory research as well as advanced methods and tools of scientific research, especially in the field of the studied specialty	has an in-depth knowledge and understanding of the principles of planning and conducting research on the marine environment and of the statistical methods used to describe and interpret biogeochemical phenomena and processes occurring in the aquatic environment	[SW4] test/exam - oral or written
[OCEANMU2-K03] is ready to effectively organize his/her own work, is active and persistent and punctuality in completing tasks, is ready to carrying out evaluation of their own activities	is prepared to exercise caution and criticism in the reception of information from scientific literature, the Internet and other media relating to marine science	[SK4] test/exam - oral or written

<table>
<tr><td>Subject contents</td><td>A1. Principles of planning experiments and field studies.
A2. Recording and storage of results.
A3. Reliability of results.
A4. Descriptive statistics of one and two variables.
A5. Parametric and non-parametric distributions (Shapiro-Wilk test, Box-Cox transformation).
A6. Outliers and extremes (Normal test,Thickness test,Tukey test, data cleaning).
A7. Examples of applications and interpretation of regression analysis (linear and non-linear regression) in marine environmental studies.
A8. Point and interval estimation.
A9. Examples of application of tests of significance of differences in environmental studies (Student's t-test, Mann-Whitney U-test, ANOVA, Wilcoxon, Kruskal-Wallis ANOVA, Friedman, post-hoc tests).
A10. Application and interpretation of multivariate analyses (principal component analysis, factor analysis, cluster analysis) in marine environmental studies.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>fundamentals of statistics</td></tr>
<tr><td>Assessment methods and criteria</td><td><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Test</td><td>51.0%</td><td>100.0%</td></tr>
</table></td></tr>
<tr><td>Recommended reading</td><td><table>
<tr><td>Basic literature</td><td>Andrzej Stanisz, Przystępny kurs statystyki z zastosowaniem STATISTICA na przykładach z medycyny.(tom I, II i III), wydawca StatSoft Polska, łącznie 1900s.</td></tr>
<tr><td>Supplementary literature</td><td>Internetowy podręcznik statystyki (http://www.statsoft.pl/textbook/stathome.html)

Radosław Kala, Statystyka dla przyrodników, Wydawnictwo Uniwersytetu Przyrodniczego w Poznaniu (wydanie III) 234s.</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
</table></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>To plan an environmental or experimental study in such a way that a specific statistical tool can be used to verify a hypothesis.</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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