University of Gdańsk

Subject card

Subject name and code	Marine Physics Laboratory I, PG_00206224		
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	2	ECTS credits	4.0
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 Marek Kowalewski	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	0.0	0.0	50.0	0.0	0.0	50

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	50	2.0	48.0	100

Subject objectives

Introduction into realities and specifics of research work; developing the ability to plan and organize research work in marine physics; mastering the use of research equipment, software and research methods relevant to the prepared thesis (incl. programming proficiency in a selected language and digital signal analysis)

Familiarisation with bibliography tools; conducting a literature review and planning thesis research.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[OCEANMU2-W03] has an in-depth understanding of research methods used in oceanography and related sciences, and interprets their mechanisms and interrelationships across different spatial and temporal scales	Knows and understands in-depth the research methods used in marine physics, including programming techniques and digital signal analysis.	[SW2] presentation/project/paper/ report
[OCEANMU2-U05] is able to use source information in Polish and a chosen foreign language, including archival and electronic databases, within the field of oceanography; critically analyzes and synthesizes information, and is capable of performing critical interpretation and synthesis of data	Is able to use source literature in Polish and English as well as archival and electronic databases on marine physics, and to critically evaluate and synthetically approach them.	[SU2] presentation/project/paper/ report
[OCEANMU2-U06] is able to use specialized computer software as well as advanced mathematical and statistical methods to analyze data and describe processes and phenomena occurring in the marine and coastal environment; evaluates their reliability and usefulness and performs critical analysis	Student is able to use programming techniques, digital signal analysis and selected statistical techniqiues in data analysis and description of processes relevant to the thesis prepared.	[SU2] presentation/project/paper/ report [SU6] demonstration of practical skills
[OCEANMU2-K05] is ready to follow the rules occupational health and safety, taking care of the entrusted person specialized and recognition equipment emergency situations and take appropriate action activities	Is prepared to comply with occupational health and safety regulations in computer laboratory, while performing at-sea and field measurements, to take care of the specialist equipment entrusted to him, and to recognize hazardous situations in the scope of the research being carried out, taking appropriate preventive and intervention measures.	[SK2] presentation/project/paper/ report

Subject contents

Computer Laboratory including project/short problems on:

1. Measurement techniques, error estimation and the use of statistics
2. Toolboxes for statistics, DSP, and linear algebra.
3. FFT, techniques for spectra estimation, filter construction and the use of general linear models.
4. Introduction to data-based modelling
5. Techniques and tools useful in thesis preparation (reference management software),

Independent work includes preparation for laboratory classes as well literature review and planning the research/ calculations needed for thesis completion.

Prerequisites and co-requisites

Passing grade in "Programming and data analysis" OR good command of the programming language used in the course.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
reports on practical exercises	51.0%	100.0%

Recommended reading

Basic literature	• Makać W., Urbanek-Krzysztofiak D., 2006. *Metody opisu statystycznego*, Wyd. UG, Gdańsk • Thomson R.E., Emery W.J., 2024. Data analysis methods in Physical Oceanography, 4th Ed. (or a previous edition)
Supplementary literature	• Balicki A., Makać W., 2006. *Metody wnioskowania statystycznego*, Wyd. UG, Gdańsk • Łomnicki A., 1995. *Wprowadzenie do statystyki dla przyrodników*, PWN, Warszawa
eResources addresses	

Example issues/ example questions/ tasks being completed

Fourier analysis of time series

Work placement

Not applicable

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