University of Gdańsk

Subject card

Subject name and code	Marine Optics - laboratory, PG_00206212		
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	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 Aleksandra Cupiał	
	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	1.0	19.0	50

Subject objectives

Presentation of topics and methods applicable to (a) - the analysis of the optical state of water and (b) - the attenuation of radiant energy in the water column within the framework of linear optics in scalar formulation

Learning outcomes

Course outcome	Subject outcome	Method of verification
[OCEANMU2-W02] knows and understands complex processes and phenomena occurring in the marine environment, with particular emphasis on the coastal zone, as well as complex relationships between living and non-living elements of the aquatic environment	knows and understands complex processes and phenomena of marine optics in ocean and coastal waters including the interaction of light with marine life.	[SW4] test/exam - oral or written [SW5] implementation of a problem task
[OCEANMU2-U01] is able to formulate and solve complex and unusual problems regarding the functioning of individual components of the marine environment using knowledge from various fields and scientific disciplines and propose solutions	is able to formulate and solve complex and unusual problems of marine optics using mathematical and computational techniques as well as knowledge from various fields and scientific disciplines and propose solutions	[SU4] test/exam - oral or written [SU5] implementation of a problem task
[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 ready to effectively organize his/her own work on assigned problems on marine optics, is active and persistent and punctuality in completing tasks, is ready to carrying out evaluation of their own activities	[SK5] implementation of a problem task [SK8] observation of student's independent or team work
[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 research methods used in marine optics	[SW4] test/exam - oral or written [SW5] implementation of a problem task
[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	can use mathematical methods and mathematical software to analyze data and solve marine optics problems referring to processes in ocean and coastal waters.	[SU5] implementation of a problem task

Subject contents

1. Definitions of objective and subjective photometry;
2. Spectral analysis of attenuation coefficients of optically active constituents in seawater
3. Simplified solutions to the radiative transfer and illumination equations (single and quasi-single scattering);
4. Analysis and interpretation of measurement data.

Prerequisites and co-requisites

The basics of single-variable calculus and first order, linear differential equations.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
final asessment	51.0%	80.0%
problems solvec in class	51.0%	20.0%

Recommended reading

Basic literature	Jerzy Dera 2003, Fizyka morza, PWN, 540
Supplementary literature	Mobley C.D., 1994, Light and water - radiative transfer in natural waters, Wyd. Academic Press, London, 592 www.oceanopticsbook.info (Ocean optics web book)
eResources addresses	

Example issues/ example questions/ tasks being completed

Solve a simplified radiative transfer equation

Work placement

Not applicable

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