University of Gdańsk

Subject card

Subject name and code	Phototransformation of Natural Water Constituents - laboratory , PG_00204965						
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							
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Waldemar Grzybowski				
	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	Familiarization with methods of examining the influence of solar radiation on the components of natural waters						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[OCEANMU2-K01] is ready to plan, implement and supervise, individually or collectively, next stages of the entrusted task, is ready to take responsibility for its results;	is able to plan and implement, individually or in a team, assigned tasks, cooperates in the team, performing various roles in it (content	[SK6] demonstration of practical skills [SK8] observation of student's independent or team work
[OCEANMU2-U02] is able to fluently and accurately use scientific terminology when presenting and discussing oceanographic issues, and to propose and justify innovative solutions	knows and understands specialized terminology to an in-depth level related to phototransformation of components of natural waters	[SU2] presentation/project/paper/ report
[OCEANMU2-W01] knows and understands in-depth specialized terminology used in oceanography and related sciences (in Polish and a selected foreign language)	knows and understands specialized terminology to an in-depth level related to phototransformation of components of natural waters	[SW2] presentation/project/paper/ report
[OCEANMU2-U03] can plan and carry out independently advanced research and measurements, both in field and laboratory, using appropriately selected measurement and analytical techniques in the field of oceanography, adequately to the studied specialty and research problem	can make measurements and calculations in the field of photochemistry. He/she can design an experiment aimed at solving a research problem in environmental photochemistry. (program content: B.1-4	[SU8] observation of student's independent or team work
[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	follows the rules of occupational health and safety, takes care of specialist equipment entrusted to him, is able to recognize threats arising from the task performed (program content: B.1-4	[SK8] observation of student's independent or team work

Subject contents

B. Laboratory issues B.1 Phototransformation of dissolved organic matter (quantum yield estimation) B.2 Methods of generating hydroxyl radicals B.3 Photoreduction of iron and nitrates B.4 Degradation of chromophoric dissolved organic matter in the presence of titanium dioxide B.5 Presentation of a selected problem in the field of photochemistry of natural waters based on an English-language scientific publication

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Presentation	51.0%	30.0%
Test	51.0%	70.0%

Recommended reading

Basic literature	Zofia Sawicka - Photochemical processes in the environment, 2001, Wydawnictwo UJ, Kraków Selected scientific articles on the optical properties of natural waters
Supplementary literature	Pierre Boule (wyd.), Environmental Photochemistry Part I (Handbook of Environmental Chemistry), 1999, Springer, Ber-lin Asa Leifer, The kinetics of environmental aquatic photochemistry, 1988, Oxford University Press, Oxford
eResources addresses	

Example issues/ example questions/ tasks being completed

Work placement

Not applicable

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