University of Gdańsk

Subject card

Subject name and code	Marine Physics - auditory classes, PG_00206139						
Field of study	Oceanography						
Date of commencement of studies	October 2026		Academic year of realisation of subject	2027/2028			
Education level	Bachelor's studies		Subject group	Obligatory subject group in the field of study			
Mode of study	full-time studies		Mode of delivery	at the university			
Year of study	2		Language of instruction	Polish			
Semester of study	4		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	mgr Marta Misiewicz					
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	45.0	0.0	0.0	0.0	45
	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	45		3.0	52.0	100	
Subject objectives	Acquire knowledge and understanding of basic laws governing physical processes occurring in the sea						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[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	Knowledge about research methods and approaches (mathematical, statistical and IT tools) used in oceanography in order to describe and interpret physical phenomena in the sea	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion
[OCEANL3-W02] has a broad knowledge and understanding of physical, biological, chemical, and geological processes and phenomena occurring in aquatic environments, with particular emphasis on the marine environment	Knowledge and understanding of processes and phenomena occurring in marine environment	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion
[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	Ability to apply mathematical methods in data analysis	[SU1] oral statement/conversation/ discussion [SU4] test/exam - oral or written [SU8] observation of student's independent or team work
[OCEANL3-U01] is able to use the current scientific terminology in the field of oceanography in various forms of expression	Ability to use correctly science terminology in different forms of expression in the field of marine physics	[SU1] oral statement/conversation/ discussion [SU4] test/exam - oral or written [SU8] observation of student's independent or team work
[OCEANL3-W01] has an advanced knowledge and understanding of the terminology used in oceanography and related exact and natural sciences (in Polish and a selected foreign language)	Knowledge and understanding of the basic concepts and terms used in the field of marine physics and related science (in Polish and English)	[SW1] oral statement/ conversation/discussion [SW3] text preparation/written work [SW5] implementation of a problem task

Subject contents

Solar radiation as a primary source of energy on the earth, its distribution and consequences, role of radiation in energy exchange between the sea and atmosphere (based on black body radiation laws). Molecular structure and physical properties of the seawater. Elements of thermodynamics - seawater equation of state, specific heat, adiabatic process. Equilibrium and simple models od sea currents. Diffusion and advection of mass, heat and momentum in the sea. Acoustic waves in the sea. Downward irradiance transport in aquatic environment.

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
written tests	51.0%	50.0%
activity	51.0%	25.0%
short written tests	51.0%	25.0%

Recommended reading

Basic literature	Dera J.: Marine Physics. Wyd. PWN, Warszawa, 1983, 2003. Druet, Kowalik, 1970, Marine dynamics, Wyd. Morskie Gdańsk
Supplementary literature	Massel S.R., 2010. Hydrodynamical processes in marine ecosytems. Wyd. Uniwersytetu Gdańskiego.
eResources addresses	

Example issues/ example questions/ tasks being completed

Prove that Coriolis acceleration is perpendicular to the horizontal water current

Work placement

Not applicable

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