University of Gdańsk

Subject card

Subject name and code	Principles of Marine Physics - lecture, PG_00131489		
Field of study	Marine Hydrography		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2025/2026
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	3.0
Learning profile	practical	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 Jordan Badur	
	Teachers	dr Jordan Badur	

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	45.0	0.0	0.0	0.0	0.0	45

E-learning hours included: 0.0

eNauczanie source addresses:

Moodle ID: 13470 ATC-WOiG-HYDR-INZ35DZ-(2025/2026)- Podstawy Fizyki morza
https://mdl.ug.edu.pl/course/view.php?id=13470

Additional information:

When necessary 20% of classes can be conducted by e-learning

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	12.0	25.0	82

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
[HML3-W02] selected phenomena and processes occurring in the hydrosphere, atmosphere, lithosphere and biosphere, their interconnections and relations, as well as practical applications of this knowledge in professional activities related to the field of study	Knowledge and understanding of physical phenomena and processes occurring in the water environment, in the sea in particular, as well as practical applications of this knowledge	[SW4] test/exam - oral or written
[HML3-W01] selected facts, phenomena and processes, as well as methods and theories concerning them, explaining the complex relationships between them, constituting basic general knowledge in the field of scientific disciplines forming the theoretical foundations specific to the field of study	Knowledge of basic facts, phenomena and processes from the field of physics as well as theoretical basis explaining complex relationships between them, which is necessary to understand phenomena and processes occuring in water environment	[SW4] test/exam - oral or written
[HML3-U02] select and apply basic research techniques and tools in the field of aquatic environment research, as well as plan and carry out measurements, develop the obtained results and interpret them correctly	Ability to use elementary mathematical and statistical methods for analysing data and describing processes occurring in the sea environment	[SU4] test/exam - oral or written
[HML3-W03] directions of development and the latest discoveries in the field of scientific disciplines forming the theoretical basis appropriate to the field of study	Knowledge and understanding of basic notions and terms used in science, basic notions and terms in the field of marine science including those ones relating to oceanographic research development	[SW4] test/exam - oral or written
[HML3-U14] use the applicable terminology in presenting and discussing problems related to the field of study	Ability to use correctly current terminology when presenting and discussing problems in the field of physics	[SU4] test/exam - oral or written
[HML3-U08] independently use the professional literature available in traditional and electronic form, make an assessment, critical analysis and synthesis as well as the correct interpretation of the information obtained	Ability to study on one's own available literature (traditional and with the use of electronic media) in the field of marine physics, ability to make reliable estimation, critical analysis and synthesis as well as interpretation of collected information	[SU4] test/exam - oral or written
[HML3-K02] correctly determine the priorities in professional work for the implementation of a task specified by himself/ herself or others	Readiness to perform on time individual as well as group tasks	[SK4] test/exam - oral or written

Subject contents

Black body radiation laws.Solar energy flux at the Earth and its distribution. Molecular structure and physical properties of seawater. Forces acting on water in the ocean. Elements of seawater thermodynamics. Equilibrium and water movement - examples of different type of sea currents, wave and convection. Molecular and turbulent exchange of mass, heat and momentum. Acoustic waves in the sea. Basis of marine optics.

Prerequisites and co-requisites

Differential and integral calculus at elementary level

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
credit	51.0%	100.0%

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

Analysis of different expressions.for seawater equation of state.

Work placement

Not applicable

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