University of Gdańsk

Subject card

Subject name and code	Principles of Marine Physics - labratory excercises, PG_00131488		
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 Subject group related to practical vocational preparation
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	mgr Marta Misiewicz	
	Teachers	mgr Marta Misiewicz	

Lesson types

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

E-learning hours included: 0.0

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	10.0	30.0	85

Subject objectives

To acquire knowledge and understanding of the basic laws governing physical phenomena 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	[SW1] oral statement/ conversation/discussion [SW3] text preparation/written work [SW5] implementation of a problem task
[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	[SU1] oral statement/conversation/ discussion [SU3] text preparation/written work [SU5] implementation of a problem task
[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 related methods and theories explaining complex relationships between them, which are necessary to understand phenomena and processes occuring in water environment	[SW1] oral statement/ conversation/discussion [SW3] text preparation/written work [SW5] implementation of a problem task
[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	[SW1] oral statement/ conversation/discussion [SW3] text preparation/written work [SW5] implementation of a problem task
[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	[SK3] text preparation/written work
[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	[SU1] oral statement/conversation/ discussion [SU3] text preparation/written work [SU5] implementation of a problem task
[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	[SU1] oral statement/conversation/ discussion

Subject contents

Radiation of the sun as a source of energy and its distribution on the earth (based on black body radiation laws). Molecular structure and physical properties of seawater. Elements of thermodynamics: the first low of thermodynamics, specific heat, adiabatic process, seawater equation of state. Forces acting in the ocean. Equilibrium and water movement - sea currents, wave and convection. Molecular and turbulent exchange of mass, heat and momentum. - transport equations. Acoustic waves in the sea. Elements of marine optics - optical properties of seawater and downward irradiance transport.

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
short written tests	51.0%	25.0%
activity	0.0%	25.0%
written tests	51.0%	50.0%

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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