University of Gdańsk

Subject card

Subject name and code	The basics of physical oceanography - laboratory exercises, PG_00118077		
Field of study	Oceanography		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2025/2026
Education level	undergraduate studies	Subject group	
Mode of study	full-time studies	Mode of delivery	at the university
Year of study	2	Language of instruction	Polish
Semester of study	3	ECTS credits	2.0
Learning profile	academic	Assessment form	
Conducting unit	Pracownia Oceanografii Fizycznej -> Katedra Oceanografii Fizycznej i Badań Klimatu -> Faculty of Oceanography and Geography		
Name and surname of lecturer (lecturers)	Subject supervisor	dr Katarzyna Bradtke	
	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

Additional information:
Computer workshops (10 meetings):

- Working with Oceanographic Data Visualization and Analysis Software
- Solving tasks related to oceanography
- Discussion.

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	3.0	27.0	60

Subject objectives

Understanding and comprehending:

- the spatial and temporal variation of temperature, salinity, and density of water in oceans and the processes shaping this variation.
- the fundamental dynamic processes in the ocean (such as differential mixing and diffusion, wind-driven currents, and wind waves).
- the basics of marine acoustics (sound propagation and refraction in the sea; the sound channel)

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[OCEANL3-K04] is willing to constantly deepen knowledge in the field of oceanography and improve professional qualifications, supported by the knowledge of experts	students show activity, persistence and promptness during the realization of individual and team-based tasks	[SK8] observation of student's independent or team work
	[OCEANL3-K03] is ready to exercise caution and criticism in accepting information from scientific literature, the Internet and other media relating to natural sciences	Students are ready to undertake professional challenges posed by academic advisor	[SK3] text preparation/written work
	OCEANL3-W03	Students have knowledge about the basic concepts and terms used in natural sciences; students understand and can describe basic concepts in the field of marine sciences, and are familiar with the development of oceanography, i.e. with the most important directions and the newest research methods	[SW3] text preparation/written work
	OCEANL3-U03	Students use the basic mathematical and statistical methods to analyze data and characterize the phenomena and processes that occur in marine environment	[SU3] text preparation/written work [SU5] implementation of a problem task
	OCEANL3-U01	Students are able to use current scientific terminology in presenting and discussing problems in the field of physical oceanography	[SU3] text preparation/written work
	OCEANL3-W01	Students have clear knowledge in the fields of mathematics, physics, chemistry, biology and ecology that is necessary for understanding the basic phenomena and processes occurring in aquatic environment	[SW3] text preparation/written work

Subject contents

1. Visualization of Oceanographic Data (Ocean Data View Program). The spatial and temporal variability of seawater salinity, temperature, and density, the depth of thermocline and halocline.

2. T-S Diagrams. Water Masses and their vertical stability, the Väisäla-Brunt parameter.

3. Mixing in the Ocean: Differential diffusion. The Turner angle.

4. Wind-Driven Currents, Ekman Theory, Upwelling, and Downwelling.

5. Wind Waves.

6. Sound Propagation in the Sea and the Sound Channel.

Prerequisites and co-requisites

basic computer skills in Windows environment (scope of courses: "ABC IT", "Technologia informacyjna - ćw. laboratoryjne")

Attending the course Physical Oceanography - lecture in parallel

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
	51.0%	75.0%
	51.0%	25.0%

Recommended reading

Basic literature

Talley i in., 1996, Descriptive Physical Oceanography. An Introduction, Elsevier, https://booksite.elsevier.com/DPO/.

Stewart, R.H., 2008, Introduction to physical oceanography; https://open.umn.edu/opentextbooks/textbooks/20.

Mellor G., 1996, Introduction to physical oceanography, Am. Inst. Phys., 258s.

Duxbury, A.B. Duxbury A.C., Sverdrup, K.A., 2002, Oceany świata, PWN, 636s.

	Supplementary literature	Lisicki A., 1996, Pływy na morza i oceanach, GTN, 129s. Massel S., 2010, Procesy hydrodynamiczne w ekosystemach morskich, Wyd. Univ. Gda., 495s.
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	

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