University of Gdańsk

Subject card

Subject name and code	Physics - classes , PG_00200177		
Field of study	Marine Hydrography		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2026/2027
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	1	Language of instruction	Polish
Semester of study	2	ECTS credits	2.0
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 Wojciech Brodziński	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	0.0	30.0	0.0	0.0	0.0	30

E-learning hours included: 0.0

Additional information:

problem-solving classes.

If necessary, up to 6 hours of classes can be conducted remotely.

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

1. Providing knowledge and developing skills in the use of higher mathematics to describe physical phenomena and the physical interpretation of the obtained mathematical solutions.

2. Acquiring calculating proficiency in solving basic physical problems.

3. Creating the basis for the effective use of subsequent courses on marine physics and marine hydrography.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[HML3-W01] knows and understands, at an advanced level, 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	knows at an advanced level the physical basis of phenomena and processes occurring in the marine environment and the methods used in oceanographic and hydrographic research	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion [SW5] implementation of a problem task
[HML3-U04] is able to use analytical, simulation and experimental methods to identify, formulate and solve engineering tasks	is able to use physical and mathematical methods to formulate and solve engineering tasks	[SU1] oral statement/conversation/ discussion [SU4] test/exam - oral or written [SU5] implementation of a problem task

Subject contents

Auditory exercises will include solving exercises illustrating selected topics from the lecture:

1. Motion of a material point: Characteristics of motion. Various types of motion (uniform linear motion; non-uniform linear motion; motion on a plane; circular motion). Relativity of motion.

2. Dynamics: Force. I III Newton's laws of motion. Types of forces in nature. Momentum. The principle of conservation of momentum. Work. Conservative forces i unconservative. Mechanical energy. The principle of conservation of energy.

3. Mechanical oscillations: Parameters describing harmonic oscillations. Equation of vibrations of a harmonic oscillator. Energy in oscillating motion. Free, damped and forced oscillations. Resonance phenomena.

4. Basics of wave motion. Description of a plane wave, parameters characterizing the wave.

Prerequisites and co-requisites

Knowledge of the basics of higher mathematics.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Activity (extra points, max. +10%)	51.0%	0.0%
Short entry tests	51.0%	30.0%
Final test	51.0%	70.0%

Recommended reading

Basic literature	1. Samuel J. Ling, William Moebs , Jeff Sanny, 2018, Fizyka dla szkół wyższych, OpenStax Polska 2. David Halliday, Robert Resnick, Jearl Walker, 2007. Podstawy fizyki - tom 1. Mechanika. Wydawnictwo Naukowe PWN. 3. David Halliday, Robert Resnick, Jearl Walker, 2007. Podstawy fizyki - tom 2. Mechanika, drgania i fale, termodynamika. Wydawnictwo Naukowe PWN.
Supplementary literature	1. Orear J.: Fizyka. Tom 1 i 2. WNT, 2008. 2. Jearl Walker, 2011. Podstawy fizyki. Zbiór zadań. Wydawnictwo: Naukowe PWN.
eResources addresses	

Example issues/ example questions/ tasks being completed

1. A ball was dropped from a height of h = 20 m. What is its speed at the earth's surface?

2. Based on the equation of harmonic motion x(t), determine the speed and acceleration in this motion for a given instant of time t.

3. A car with a mass of 1500 tons initially moving at a speed of 50 km/h begins to brake and stops after travelling a distance of 30 m. Calculate the braking force.

Work placement	Not applicable

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