University of Gdańsk

Subject card

Subject name and code	Mechanics, PG_00182132						
Field of study	Medical Physics						
Date of commencement of studies	October 2025		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 scientific research 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	1		ECTS credits	4.0			
Learning profile	academic		Assessment form	exam			
Conducting unit	Division of Atomic and Molecular Physics -> Institute of Experimental Physics -> Faculty of Mathematics, Physics and Informatics -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Marek Józefowicz				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	30.0	0.0	0.0	0.0	60
	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	60		0.0		60.0	120
Subject objectives	An academic exploration of the fundamental branch of physics, classical mechanics, with particular emphasis on physical phenomena and technical problems encountered in the medical community. A presentation of physics as a fundamental science for the entire group of natural sciences, including medicine, chemistry, and biology.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[FIZMEDL3_W01] Knows and understands at an advanced level the phenomena, principles, laws and theories specific to physics and biophysics.	The student has knowledge: a. of basic concepts, principles, and theories, as well as their historical development and significance for the advancement of science and natural sciences, including medicine, understanding of the world, and human development; b. of classical mechanics, enabling understanding of physical phenomena and processes occurring in nature; c. of the basic concepts and laws of the fundamental branch of classical physics, namely classical mechanics.	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion [SW3] text preparation/written work
[FIZMEDL3_U01] He can formulate, analyse, and solve complex problems in physics and medicine, using mathematical formalism, based on the physical phenomena, principles, and theories he has learned.	Student: a. formulates basic physical theorems and laws, using mathematical formalism to record them; b. uses vector, differential, and integral calculus to solve physical problems in classical mechanics; c. searches for information in the literature and other sources, interprets it, and applies it to the problem at hand.	[SU1] oral statement/conversation/ discussion [SU3] text preparation/written work [SU4] test/exam - oral or written

Subject contents

I. Kinematics of a material point: 1. Description of motion 2. Description of motion in different coordinate systems (natural, polar) 3. Description of the relativity of motion
II. Dynamics of a material point: 1. First law of motion (Newton's first law of motion) 2. Second law of motion (Newton's second law of motion) 3. Third law of motion (Newton's third law of motion) 4. Principle of conservation of mechanical energy (work, power, kinetic energy, potential energy) 5. Law of universal gravitation 6. Dissipative forces
III. Mechanics of a system of material points: 1. Equations of motion for a system of material points 2. Two-body problem 3. Momentum, angular momentum, and energy of a system of material points 4. Center of mass system 5. Collisions and fundamentals of scattering theory

Prerequisites and co-requisites

Knowledge of physics and mathematics at the high school level.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
no aplicable	51.0%	40.0%
no aplicable	51.0%	60.0%

Recommended reading

Basic literature	1. A. K. Wróblewski, J. A. Zakrzewski, Wstęp do fizyki, Tom 1, PWN, Warszawa 1984; 2. D. Halliday, R. Resnick; Fizyka, PWN, Warszawa 2003/2004; 3. R. Feynman, Feynmana wykłady z fizyki, PWN 1974; 4. C. Kittel, W. D. Knight, M. A. Ruderman, Mechanika, PWN, Warszawa 1975.
Supplementary literature	no aplicable
eResources addresses	

Example issues/ example questions/ tasks being completed

no aplicable

Work placement

Not applicable

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