



Subject card

Subject name and code	Introduction to Higher Physics, PG_00055138						
Field of study	Mechanical Engineering						
Date of commencement of studies	October 2026	Academic year of realisation of subject				2026/2027	
Education level	first-cycle 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	1	ECTS credits				3.0	
Learning profile	general academic profile	Assessment form				assessment	
Conducting unit	Institute of Naval Architecture -> Faculty of Mechanical Engineering and Ship Technology -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Małgorzata Śmiałek-Telega					
	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						
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		6.0		39.0	75
Subject objectives	The aim of the classes conducted in the form of tutorial is to learn and master strategies for solving examples from classical physics necessary to solve engineering problems.						
Learning outcomes	Course outcome		Subject outcome			Method of verification	
	K6_U01		can solve tasks from classical physics and interpret necessary solutions needed for engineering problems.			[SU1] Assessment of task fulfilment	
	K6_W02		has knowledge of classical physics necessary to solve engineering problems.			[SW1] Assessment of factual knowledge	
Subject contents	Course content – exercises Problem-solving strategies based on equations of motion and interpretation of the derivative. Graphical representation of movement. Classification of forces. Information about the system based on Newton's laws of motion for translation and rotation. Modeling the dynamics of motion of simple systems. Testing the balance of a mechanical system. Conclusions from the principle of conservation of mechanical energy. Conclusions from the principle of conservation of momentum and angular momentum. Strategies for solving problems of systems moving in harmonic and damped harmonic motion based on equations of motion and derivative interpretation. Problem-solving for DC circuits. Information about the thermodynamic system on a <u>micro and macro scale</u> . State functions and process functions.						
Prerequisites and co-requisites	High school level physics knowledge						
Assessment methods and criteria	Subject passing criteria		Passing threshold			Percentage of the final grade	
	Midterm colloquium		70.0%			100.0%	
Recommended reading	Basic literature		K. Wrzask, Physics problems step by step, Faculty of Mechanical Engineering and Ship Technology, PG				
	Supplementary literature		https://openstax.org/details/books/university-physics-volume-1 https://openstax.org/details/books/university-physics-volume-2				
	eResources addresses						

Example issues/ example questions/ tasks being completed	A hoop of mass $m = 0.2$ kg and radius $r = 25$ cm is released and rolls without slipping on a ramp with an inclination angle of $\alpha = 60^\circ$. Moment of inertia for a hoop $I = mr^2$ a) Please outline all the forces acting on the hoop. b) Please write down the second law of dynamics for the translational and rotational motion of the hoop. c) What is the linear acceleration of the hoop?
Practical activities within the subject	Not applicable

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