

Subject card

Subject name and code	Basics of technical physics, PG_00020778								
Field of study	Technical Physics								
Date of commencement of studies	October 2022		Academic year of realisation of subject			2024/2025			
Education level	first-cycle studies		Subject group			Optional subject group 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	3		Language of instruction			Polish			
Semester of study	5		ECTS credits			6.0			
Learning profile	general academic profile		Assessment form			exam			
Conducting unit	Katedra Fizyki Teoretycznej i Informatyki Kwantowej -> Faculty of Applied Physics and Mathematics						ematics		
Name and surname	Subject supervisor		prof. dr hab. Anna Perelomova						
of lecturer (lecturers)	Teachers		prof. dr hab. Anna Perelomova						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Projec	:t	Seminar	SUM	
	Number of study hours	30.0	0.0	0.0	0.0		30.0	60	
	E-learning hours included: 0.0								
Learning activity and number of study hours	Learning activity Participation in classes include plan				Self-study		SUM		
	Number of study 60 hours			15.0		75.0		150	
Subject objectives	The aim of the course is to present physics and ways to describe interesting basic physical phenomena in a qualitative and quantitative way. There are discussed in the lecture, wherever possible, methods, and phenomena needed to explain the principles of equipment and technologies in various fapplications.								
Learning outcomes	Course outcome		Subject outcome			Method of verification			
K6_W01			A student understands the place of physics and its physical applications in everyday life and unity of different field of physics.			[SW1] Assessment of factual knowledge			
	K6_U07		A student is able to apply knowledge in simple technical tasks. A student knows how to use a mathematical tool. A student is able to solve basic tests.			[SU3] Assessment of ability to use knowledge gained from the subject			
K6_W02		A student understands connection of different fields of physics and common mathematical apparatus.			[SW1] Assessment of factual knowledge				
	K6_U08		A student is able to solve tasks related to the topic lectures and present solutions in written form.			[SU3] Assessment of ability to use knowledge gained from the subject			

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Introduction Types of physical quantities (tensors; scalars, vectors as tensors of order 0 and I and operations on these quantities (th) Mechanics A force, I. II. III Newton's laws, Work of force. The principle of conservation of momentum. Potential and non-potential forces (3h), Potential energy and the law of conservation of energy (2h.) Harmonic oscillations, Kinetic and potential energy of vibrations. Small oscillations. Damped oscillations and the concept of irreversible changes (2h). Dynamics of rotational motion. Angular velocity, angular acceleration. Moment of force, angular momentum (3h), Principle of conservation of angular momentum. Moment of inertia of rigid bodies. Statics of rigid bodies (3h). Basics of Thermodynamics. Zeroth law of thermodynamics. The first law of thermodynamics. Caloric and thermal equations of state (4h). Specific heat. Thermodynamics of an ideal gas. The concept of equilibrium and non-equilibrium thermodynamic transformations. Mass and heat fluxes (4h). Basics of wave theory. Sound waves. Wave propagation in confined media. Standing wave. Interference. Doppler effect. (4h)Shock waves. Dispersion equation. Dispersion relations. Solitons(4h) Prerequisites and co-requisites Assessment methods and criteria Subject passing criteria passing threshold Percentage of the final grade fore learning to 10.0% Subject passing criteria passing threshold Percentage of the final grade fore learning to 10.0% Subject passing criteria 1. Jay Orear, Physics, vol 1-2 (any edition) Privates for higher schools, Man authors: Samuel J. Ling, Trumen Stite University, Jovea Maymount University William lifebbs, vol. I-1 ((available at the Fuculty website)).								
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	 II, III Newton's laws . To determine the moment of inertia of a rigid body around the axis of rotation. To prove that the angle between vectors and the vector's magnitude are scalars. Thermodynamics of an ideal gas.
Work placement	Not applicable

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