



Subject card

Subject name and code	TECHNICAL PHYSICS, PG_00070669						
Field of study							
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		English		
Semester of study	2		ECTS credits		6.0		
Learning profile	general academic profile		Assessment form		exam		
Conducting unit	Division of Atomic Molecular and Optical Physics -> Institute of Physics and Applied Computer Science -> Faculty of Applied Physics and Mathematics -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Patrycja Stefańska-Ptaszek				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	30.0	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		3.0		87.0	150
Subject objectives	Interprets physical phenomena in an advanced way, using properly selected analytical and empirical methods						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_U04] develops logical solutions to complex or unstructured problems, even under conditions of uncertainty.		formulates correct conclusions based on the analysis of complex physical phenomena		[SU3] Assessment of ability to use knowledge gained from the subject		
	[K6_W02] possesses advanced knowledge of methods and techniques that enable precise formulation and effective problem solving.		demonstrates preparation for formulating and solving problems, based on advanced knowledge of physical phenomena		[SW1] Assessment of factual knowledge		

Subject contents	Course content – lecture		
	1. Vectors and vector operations. Scalar and vector physical quantities. 2. Kinematics and dynamics of a material point. 3. Rectilinear and curvilinear motion. 4. Rigid body dynamics, particle systems. 5. Inertial and non-inertial systems. 6. Elements of fluid mechanics. 7. Thermodynamics. Ideal gas transformations. Entropy. 8. Kinetic theory of gases. 9. Elements of statistical physics. 10. Oscillatory and wave motion. 11. Elements of wave and geometric optics.		
	Course content – laboratory		
	Conducting measurements and completion of all laboratory exercises. Preparing reports and providing theoretical preparation for each exercise. 1. Determination of the liquid density. 2. Determination of the acceleration due to gravity using a simple pendulum. 3. Determination of Young's modulus using the deflection arrow method. 4. Determination of the relative electrical permittivity of solids. 5. Study of longitudinal sound waves in rods. 6. Measurment the focal length of lenses using the Bessel method. 7. Determination of the linear expansion coefficient of solids. 8. Determination of the electrical resistance using a Wheatstone bridge 9. Determination of the radius of curvature of a lens using Newton's rings. 10. Study of the spectra of unbalanced radiation of gases.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Laboratories	100.0%	0.0%
	Final exam	50.0%	100.0%
Recommended reading	Basic literature	1. D. Halliday, R. Resnick and J. Walker, Basics of physics, PWN volume 1-5 2. Feynman's physics lectures, PWN Warszawa 3. J. Orear, Physics, WNT, volume 1 and 2 4. Physics for higher education, OpenStax https://openstax.org/details/books/fizyka-dla-szk%C3%B3%C5%82-wy%C5%BCszych-tom-1	
	Supplementary literature	1. Paul G. Hewitt, Physics around us, PWN Warszawa 2. I. W. Sawieliew, Physics lectures, PWN, volume 1-3	
	eResources addresses		
Example issues/ example questions/ tasks being completed	• Formulate Newton's laws of motion • Laws of thermodynamics • Damped harmonic oscillator		
Practical activites within the subject	Not applicable		

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