GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	TECHNICAL PHYSICS, PG_00070717		
Field of study	Engineering Management		
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	Part-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	Polish
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	18.0	0.0	18.0	0.0	0.0	36

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	36	3.0	111.0	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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