

## § GDAŃSK UNIVERSITY § OF TECHNOLOGY

## Subject card

Subject name and code	Physics 1, PG_00042018							
Field of study	Power Engineering							
Date of commencement of studies	October 2024		Academic year of realisation of subject		2024/2025			
Education level	first-cycle studies		Subject group		Obligatory subject group in the field of study			
Mode of study	Full-time studies		Mode of de	Mode of delivery		at the university		
Year of study	1		Language of instruction		English			
Semester of study	2		ECTS credits		2.0			
Learning profile	general academic pro	ofile	Assessment form		exam	exam		
Conducting unit	Faculty of Ocean Eng	ineering and S	Ship Technology					
Name and surname	Subject supervisor		dr hab. inż. Małgorzata Śmiałek-Telega					
of lecturer (lecturers)	Teachers		-					
Lesson types and methods	Lesson type	Lecture	Tutorial	Laboratory	Projec	t	Seminar	SUM
of instruction	Number of study hours	30.0	0.0	0.0	0.0		0.0	30
	E-learning hours inclu	ided: 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 S		SUM
	Number of study hours	30		5.0 1		15.0		50
Subject objectives	Acquisition of basic knowledge in selected branches of physics, both classical and modern. Acquiring the skills of qualitative understanding of selected principles and laws of classical physics and modern and quantitative analysis of selected phenomena in this area Understanding the basic techniques and methods of measurement of selected physical Developing social skills, such as emotional intelligence (the ability to work in a group of students), with a view to effective problem solving and tasks, sense of responsibility, honesty and integrity in academia and society.							
Learning outcomes	Course outcome		Subject outcome			Method of verification		
	[K6_U01] can obtain information from literature and other sources, organize, interpret it and draw and formulate conclusions; has the ability to self-educate, interprets the results of completed engineering tasks, is able to design simple energy systems and their systems		The student is able to solve simple problems in the field of basic physics based on examples			[SU2] Assessment of ability to analyse information		
[K6_W02] has a basic knowledge of physics (including optics, electricity and magnetism), chemistry, technical thermodynamics, fluid mechanics and general mechanics needed to understand and describe the basic phenomena occurring in devices and systems, energy plants and transmission networks and their environment		The student explains the basic knowledge in the field of physics, chemistry, technical thermodynamics and fluid mechanics, necessary to understand and describe the basic phenomena occurring in energy devices and systems and in their environment, the power industry and opportunities for further education			[SW1] Assessment of factual knowledge			

Subject contents     Infoduction: Physical quantities, vectors, the international system of units (SI ), mass, time and length, an overwear of the sizes found in nature.       Principles of dynamics: fundamental interactions, the first law of dynamics, the second law of dynamics equations of motion trajectory, the third law of dynamics, firstion. The definition of work for constant and variable fonze, the assertion of labor and energy, the definition of power , conservation of momentum is the chancial energy, the principle of conservation of momentum.       The principle of conservation of metry: energy potential, the potential energy of gravity. The links of conservation of momentum is the conservation of momentum.     The principle of conservation of angular momentum of the bodies. The principle of conservation of momentum is draglid momentum.       The principle of conservation of angular momentum is nation.     Methods of angular momentum of a figld body. The principle of conservation of angular momentum is draglid body. The principle of conservation of angular momentum is draglid body. The principle of conservation of angular momentum is draglid body. The principle of conservation of relativity.       Oriesticity: Canadomation.     Noment of force. The definition of angular momentum and energy.     Simple harmonic motion is using vectory, benefative of what were is draglid momentum.       Oriesticity: Canadomation.     Interactional is principle of conservation of momentum.     Method is angular momentum is draglid body. The principle of anservation of angular momentum is draglid body. The principle of conservation of more than and angular momentum.       Oriestity: Canadomation.     Intereactional is pre							
equalities of motion trajectory, the third aw of dynamics, friction. The definition dynakie force, the assertion of labor and energy, the definition of power, conservative forces.       The principle of conservation of energy : energy potential : the potential energy of gravity, the law of conservation of mechanical energy is the principle of conservation of onerety. The principle of conservation of energy : the principle of conservation of mechanical energy is the principle of conservation of mechanical energy is the principle of conservation of mechanical energy is the principle of conservation of menetum, rocket motion, collision of bodies.       The principle of conservation of angular momentum : rotation, moment of inertia, kinetic energy in a rotating motion. Moment of force, the definition of angular momentum, the relationship between the torque value and angular momentum.       The principle of conservation of relativity: Galiean transformation. Michelean-Mortey experiment. Einstein: building in the principle of relativity: multiantity of versits, be relativity in time, time dialon, which parador, length contraction, Lorentz transformation speed . relativistic momentum and energy.       Simple harmonic motion : swing , velocity, acceleration , forced vibration , mechanical resonance .       Mechanical waves : transverse and longitudinal waves , reflection of waves , harmonic waves , sound waves , the intensity of the wave, interference of harmonic waves , strengthening and decay of waves, standing waves , whoatons, straing, subplice reflect.       The gravitational field : the experience of Galileo's law of universal gravitation , the measurement of the gravitational field gravity and weightlessness, tidd is, Replete law , satelifter motion , and second cosmic velocity , elements of the genenel theory of	Subject contents						
conservation of mechanical energy, the principle of conservation of energy. The principle of conservation of momentum in rocket motion , collision of bodies.       The principle of conservation of angular momentum in tratation, moment of inertia, kinetic energy in a rotating motion. Moment of force, the definition of angular momentum is retailon, moment of inertia, kinetic energy in a rotating motion. Moment of force, the definition of angular momentum is retailoned by the principle of conservation of angular momentum.       The principle of conservation of angular momentum of a rigb body, the principle of conservation of angular momentum.       The principle of conservation of angular momentum of a rigb body, the principle of conservation of angular momentum.       The spacial theory of relativity : Callean transformation, Micheleon -Morkey experiment, Ensetain's principle of relativity is function the distion, twin paradox, length contraction, Lorentz transformation, the transformation speed, relativistic momentum and energy.       Simple harmonic motion : swing, velocity, acceleration, force and energy of the harmonic motion . Pendulum , physical pendulum , damped harmonic motion , force divitation , mechanical resonance .       Mechanical waves : transverse and longitudinal waves , reflection of waves , harmonic waves , standing waves , vibrations, strings , Doppler effect.       The gravitational field : the experience of Galieo's law of universal gravitation in the general theory of relativity.       Hydrodatatics : properties of liquids, Pascaf's law , hydrostatic pressure . Archimedes' principle , swimming bodies.       Hydrodynamics : characteristics of fluid motion . Bernoull's law, law of thermodynamics, engines,		equations of motion trajectory, the third law of dynamics, friction. The definition of work for constant and					
Incide     Moment of force , the definition of angular momentum , the relationship between the Erroue value and angular momentum , angular momentum of a rigid body , the principle of conservation of angular momentum .       The special theory of relativity : Galilean transformation , Michelson -Morley experiment , Einstein's principle of relativity, simultaneity of events, the relativistic muse time dilation , win paradox, length contraction , Lorentz transformation speed , relativistic momentum and energy.       Simple harmonic motion : swing , velocity, acceleration , force and energy of the harmonic motion . Pendulum , physical pendulum , damped harmonic motion forced vibration , mechanical resonance .       Mechanical waves : transverse and longitudinal waves , reflection of waves , standing waves , the intensity of the wave. Interference of harmonic waves , strangthening and deccay of waves, standing waves , vibrations, strings , Doppler effect.       The gravitational field : the experience of Galileo's law of universal gravitation , the ensurement of the gravitational field , gravity and weightlessness , tidal , Kepiers laws , satellite motion , and second cosmic velocity , elements of the general theory of relativity.       Hydrodynamics : characteristics of fluid motion , Bernoull's law , law Toricellego , viscosity, flow of non-viscous liquid and viscous , laminar and turbulent flow , Reynolds number , the resistance of the medium.       Temperature and heat: thermal expansion, heat, heat transfer processes, conductivity, convection.Kinetic theory of an ideal gas: diffusion, laws of thermodynamics, engines, heaters, coolers       Prerequisites and oci-requisites     Subject passing criteria     Passing threshold     Perce		conservation of mechanical energy , the principle of conservation of energy . The principle of conservation of momentum : the center of mass , the momentum of the bodies , the principle of conservation of momentum ,					
of relativity, simultaneity of events, the relativity of time, time dilation, twir paradox, length contraction, Lorentz transformation speed, relativistic internutum and energy.       Simple harmonic motion : swing, velocity, acceleration, force and energy of the harmonic motion . Pendulum, physical pendulum, damped harmonic motion, forced vibration, mechanical resonance .       Mechanical waves : transverse and longitudinal waves , reflection of waves , harmonic waves , sound waves , the intensity of the wave . Interference of harmonic waves , strengthening and decay of waves, standing waves , vibrations, strings . Doppler effect.       The gravitational field : the experience of Galileo's law of universal gravitation , the measurement of the gravitational constant , the intensity and the potential of the gravitational decay of waves , tidal , Kepler's laws , satellite motion , and second cosmic velocity , elements of the general theory of relativity.       Hydrostatics : properties of liquids, Pascal's law , hydrostatic pressure , Archimedes' principle , swimming bodies.       Hydrostatics : characteristics of fluid motion , Bernoulli's law , law Toricellego , viscosity, flow of non-viscous liquid and viscous , laminar and turbulent flow , Reynolds number , the resistance of the medium.       Temperature and heat: thermal expansion, heat, heat transfer processes, conductivity, convection Kinetic theory of an ideal gas: kinetic theory of an ideal gas, diffusion, laws of thermodynamics, engines, heaters, coolers       Prerequisites     Subject passing criteria     Passing threshold     Percentage of the final grade mod wirther as of othermodynamics, engines, heaters, coolers       Recommended reading     <		motion . Moment of force , the definition of angular momentum , the relationship between the torque value and angular momentum , angular momentum of a rigid body , the principle of conservation of angular					
Pendulum , physical pendulum, damped harmonic motion , forced vibration , mechanical resonance .       Mechanical waves : transverse and longitudinal waves , reflection of waves , harmonic waves , sound waves , the intensity of the wave. Interference of harmonic waves , strengthening and decay of waves, standing waves , vibrations, strings , Doppler effect.       The gravitational field : the experience of Galileo's law of universal gravitation , the measurement of the gravitational constant , the intensity and the potential of the gravitational field , gravity and weightlessness , tidal , Kepler's laws , satellite motion , and second cosmic velocity , elements of the general theory of relativity.       Hydrostatics : properties of liquids, Pascal's law , hydrostatic pressure , Archimedes' principle , swimming bodies.       Hydrodynamics : characteristics of fluid motion , Bernoulli's law , law Toricellego , viscosity, flow of non-viscous liquid and viscous , laminar and turbulent flow , Reynolds number , the resistance of the medium.       Temperature and heat: thermal expansion, heat, heat transfer processes, conductivity, convection.Kinetic theory of an ideal gas: kinetic theory of an ideal gas, diffusion, laws of thermodynamics, engines, heaters, coolers       Prerequisites and co-requisites and co-requisites and co-requisites and co-requisites and co-requisites and co-requisites     Percentage of the final grade written is 50.0%       Recommended reading     Basic literature     David Haliday, Robert Resnick, Jearl Walker Fundamentals of Physics,		of relativity, simultaneity of events, the relativity of time, time dilation, twin paradox, length contraction,					
waves, the intensity of the wave. Interference of harmonic waves, strengthening and decay of waves, standing waves, vibrations, strings, Doppler effect.     The gravitational field : the experience of Galileo's law of universal gravitation , the measurement of the gravitational constant, the intensity and the potential of the gravitational field , gravity and weightlessness, tidad, Kepler's laws, satellite motion , and second cosmic velocity, elements of the general theory of relativity.     Hydrostatics : properties of liquids, Pascal's law , hydrostatic pressure , Archimedes' principle , swimming bodies.     Hydrostatics : characteristics of fluid motion , Bernoulli's law , law Toricellego , viscosity, flow of non-viscous liquid and viscous , laminar and turbulent flow , Reynolds number , the resistance of the medium.     Temperature and heat: thermal expansion, heat, heat transfer processes, conductivity, convection.Kinetic theory of an ideal gas: kinetic theory of an ideal gas, diffusion, laws of thermodynamics, engines, heaters, coolers     Prerequisites and co-requisites   Subject passing criteria   Passing threshold   Percentage of the final grade and criteria     Written test (open questions)   50.0%   100.0%   Recommended reading   Basic literature		Simple harmonic motion : swing , velocity, acceleration , force and energy of the harmonic motion . Pendulum , physical pendulum , damped harmonic motion , forced vibration , mechanical resonance .					
gravitational constant , the intensity and the potential of the gravitational field , gravity and weightlessness , tidal , Kepler's laws , satellite motion , and second cosmic velocity , elements of the general theory of relativity.     Hydrostatics : properties of liquids, Pascal's law , hydrostatic pressure , Archimedes' principle , swimming bodies.     Hydrodynamics : characteristics of fluid motion , Bernoulli's law , law Toricellego , viscosity, flow of non-viscous liquid and viscous , laminar and turbulent flow , Reynolds number , the resistance of the medium.     Temperature and heat: thermal expansion, heat, heat transfer processes, conductivity, convection.Kinetic theory of an ideal gas: kinetic theory of an ideal gas, diffusion, laws of thermodynamics, engines, heaters, coolers     Prerequisites and co-requisites     Assessment methods and criteria   Subject passing criteria   Passing threshold   Percentage of the final grade     Written test (open questions)   50.0%   100.0%     Recommended reading   Basic literature   David Halliday. Robert Resnick, Jearl Walker Fundamentals of Physics.		waves , the intensity of the wave. Interference of harmonic waves , strengthening and decay of waves,					
bodies.   Hydrodynamics : characteristics of fluid motion , Bernoulli's law , law Toricellego , viscosity, flow of non-viscous liquid and viscous , laminar and turbulent flow , Reynolds number , the resistance of the medium.     Temperature and heat: thermal expansion, heat, heat transfer processes, conductivity, convection Kinetic theory of an ideal gas: kinetic theory of an ideal gas, diffusion, laws of thermodynamics, engines, heaters, coolers     Prerequisites and co-requisites     Assessment methods and criteria     Subject passing criteria   Passing threshold   Percentage of the final grade Written test (open questions)     So.0%   100.0%     Recommended reading   Basic literature   David Halliday, Robert Resnick, Jearl Walker Fundamentals of Physics,		gravitational constant , the intensity and the potential of the gravitational field , gravity and weightlessness , tidal , Kepler's laws , satellite motion , and second cosmic velocity , elements of the general theory of					
viscous liquid and viscous , laminar and turbulent flow , Reynolds number , the resistance of the medium.     Temperature and heat: thermal expansion, heat, heat transfer processes, conductivity, convection.Kinetic theory of an ideal gas: kinetic theory of an ideal gas, diffusion, laws of thermodynamics, engines, heaters, coolers     Prerequisites and co-requisites     Assessment methods and criteria     Subject passing criteria   Passing threshold     Vitten test (open questions)     50.0%   100.0%     Recommended reading   Basic literature							
theory of an ideal gas: kinetic theory of an ideal gas, diffusion, laws of thermodynamics, engines, heaters, coolers     Prerequisites and co-requisites     Assessment methods and criteria     Subject passing criteria   Passing threshold     Vitten test (open questions)   50.0%     100.0%     Recommended reading   Basic literature							
and co-requisites     Assessment methods and criteria   Subject passing criteria   Passing threshold   Percentage of the final grade     Written test (open questions)   50.0%   100.0%     Recommended reading   Basic literature   David Halliday, Robert Resnick, Jearl Walker Fundamentals of Physics,		theory of an ideal gas: kinetic theory of an ideal gas, diffusion, laws of thermodynamics, engines, heaters,					
and co-requisites     Assessment methods and criteria   Subject passing criteria   Passing threshold   Percentage of the final grade     Written test (open questions)   50.0%   100.0%     Recommended reading   Basic literature   David Halliday, Robert Resnick, Jearl Walker Fundamentals of Physics,	Prerequisites						
and criteria   Written test (open questions)   50.0%   100.0%     Recommended reading   Basic literature   David Halliday, Robert Resnick, Jearl Walker Fundamentals of Physics,							
Recommended reading     Basic literature     David Halliday, Robert Resnick, Jearl Walker Fundamentals of Physics,			-				
	and criteria	Written test (open questions)	50.0%	100.0%			
	Recommended reading	Basic literature		rl Walker Fundamentals of Physics,			

	Supplementary literature	H.D. Young, R.A. Freedman, SEARS AND ZEMANSKYS UNIVERSITY PHYSICS WITH MODERN	
		PHYSICS, Addison-Wesley Publishing Company, wyd. 12. z 2008 r.	
		D.C. Giancoli, Physics Principles with Applications, 6th Ed., Addison-Wesley, 2005; Physics: Principles	
		with Applications with MasteringPhysics, 6th Ed., Addison-Wesley 2009.	
		R.A. Serway, Physics for Scientists and Engineers with Modern Physics, 8th Ed., Brooks/Cole, Belmont	
		2009; zapowiadane jest kolejne wydanie w styczniu 2013 r.	
		P.A. Tipler, G. Mosca, Physics for Scientists and Engineers, Extended Version, W. H. Freeman 2007	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	Give the second law of dynamics an	d the conclusions resulting therefrom	
	What are conservative and non-conservative forces, what is the work done by them; Give examples of conservative and non-conservative forces		
	Give examples of systems moving harmonically; What equation describes the simple harmonic motion?; Write and draw a relationship deflection from the equilibrium position of the time; What happens if the frequency of the exciting force is close to the natural frequency of the system?		
Work placement	Not applicable		