

。 GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	, PG_00058874								
Field of study	Nanotechnology								
Date of commencement of studies	October 2022		Academic year of realisation of subject		2022/2023				
Education level	first-cycle studies		Subject group		Obligatory subject group in the field of study				
						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	1		Language of instruction			Polish	Polish		
Semester of study	2		ECTS credits			8.0			
Learning profile	general academic pr	general academic profile		Assessment form		exam			
Conducting unit	Division of Nanomaterials Physics -> Institute of Nanotechnology and Materials Engineering -> Faculty of Applied Physics and Mathematics								
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Leszek Wicikowski						
	Teachers		dr inż. Bartosz Trawiński						
			dr inż. Kamil Kolincio						
			dr inż. Leszek Wicikowski						
			dr hab. inż. Leszek Piotrowski						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Projec	oiect Seminar SUM		SUM	
	Number of study hours	30.0	30.0	30.0	0.0	•	0.0	90	
	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	90		10.0		100.0		200	
Subject objectives	Mechanics primary g skills of qualitative un phenomena in this fi techniques and meth competencies (the a	nderstanding of eld. After comp nods of measur	f principles and leting the cours ing selected ph	laws of classic e, students po ysical quantitie	al physi ssess ki s. Addit	cs and nowledg ional st	quantitative a ge about the udents devel	analysis of basic op social	

K6_W01 The student understands the importance of general physics for instances accumulation of skills increasing in technical sciences. Can use computational methods of physics. To skill physics in technical sciences. Can use computational methods of physics. To skill physics in the student uses the lecture's issues to proper for solving physical problems in mechanica methods of physics. To skill physical sciences of information in linemet. [SU3] Assessment of ability to use computational methods of physics. To skill physical sciences of information in linemet. K6_U04 The student uses the lecture's issues to programmets. He can use information in linemet. [SU3] Assessment of ability to use knowledge gained from the subject. K6_U04 The student can analyze the described sciences of information in linemet. [SU3] Assessment of factual information in linemet. K6_W03 The student can analyze the described sciences of information in linemet. [SW1] Assessment of factual information in linemet. K6_W03 The student can analyze the described sciences of information in linemet. [SW1] Assessment of factual information in linemet. Subject contents Coordinate systems, differential operators (in ceratively convolution and segmet here the operation any convolution and segmet here the operation any convolution and segmet here theorem can all advert field. States is the advance of mass, a monten onescretation of angular momentum, certral force field. States is the Relation to rouge, angular momentum, certral Science and non-concerverial and physics. Comparise the advanced mature as and correguisitites Subject pass	Learning outcomes	Course outcome	Subject outcome	Method of verification			
Subject contents Coordinate systems, differential operations (in excesse), fundamental kinematic quantities, straight and conveloped so that and the excession of angular momentum, conservation of angular		K6_W01	importance of general physics for the effective acquisition of skills necessary in technical sciences. Can use computational methods				
described experiments. He can identify key physical experiments that allowed researchers to of physics. He sees a clear relationship between theoretical knowledge and experiment use knowledge gained from the subject K6_W03 The student can think creatively and solve complex problems covering various branches of physics. It does not work schematically [SW1] Assessment of factual knowledge Subject contents Coordinate systems, differential operators (in exercises), fundamental kinematic quantities, straight and corvininear motion, integration of equations of motion. Laws of dynamics, equations of particle motion in any force field, the motion of a body with variable mass Principes of behaviour in mechanics, conservative and non-conservative field. Stoke's law Reliable mass Principes of behaviour in mechanics, conservative and co-requisites Prerequisites and co-requisites To study the course, students must know fundamental physics in the advanced matura exam scope in physics. Completing the Physics I course is necessary. Percentage of the final grade Final Exam Recommended reading Subject passing criteria Passing threshold Percentage of the final grade Final Exam Recommended reading Basic literature Physics vol. 1, Poenstax Underwork of physics Supplementary literature Hennel, Szuszkiewicz - Zadania i problemy z fizyki t1 i 12 Recommended reading The moth moves along a curve whose length is igiven by the formula s = s0cy (cl), where s0 and c - constants. Knowing that the acceleration vector amakes a constant angl		K6_U01	issues to prepare for solving physical problems in mechanics independently. He can use textbooks for this purpose and find reliable sources of information in	use knowledge gained from the			
and solve complex problems covering various branches of physics. It does not work schematically Innowledge Subject contents Coordinate systems, differential operators (in exercises), fundamental kinematic quantities, straight and curvilinear motion, integration of equations of motion Laws of dynamics, equations of particle motion in any force field, the motion of a body with variable mass Principles of behaviour in mechanics, conservative and non-conservative field, Stokes's law Rotational motion, torque, angular momentum, conservative and non-conservative field, Stokes's law Rotational motion, simple, damped and force Albehaviour in mechanics, conservative and non-conservative field, Stokes's law Rotational motion, simple, damped and force Albehaviour in mechanics, conservative and non-conservative field, Stokes's law Rotational motion, interference, standing wave, numble, Doppler effect Preequisites and correquisites To study the course, students must know fundamental physics in the advanced matura exam scope in physics. Completing the Physics I course is necessary. Assessment methods and criteria Subject passing criteria Passing threshold Percentage of the final grade Final Exam Recommended reading Basic literature Physics.vol.1, Poenstax Halliday, Resnick, Walker - fundamentals of Physics Supplementary literature Hennel, Szuszkiewicz - Zadania i problemy z fizyki t1 i t.2 eResources addresses Adres na platformic eNauczanie: Mechanika - Moodle ID: 30424 https://enauczanie.gdu.pl/modelicourse/view.php?id=30424 Example issues/ example questions/ tasks being completed		K6_U04	described experiments. He can identify key physical experiments that allowed researchers to formulate the appropriate laws of physics. He sees a clear relationship between theoretical	use knowledge gained from the			
curvilinear motion, integration of equations of motion Laws of dynamics, equations of particle motion in any force field, the motion of a body with variable mass Principles of behaviour in mechanics, conservative and non-conservative field, Stokes's law Rotational motion, lorque, angular momentum, conservative and non-conservative field, Stokes's law Rotational motion, lorque, angular momentum, conservative and non-conservative field, Stokes's law Rotational motion, lorque, angular momentum, conservative and momentum, central force field, kepler's laws Rigid body, a centre of mass, a moment of inertia, Steiner theorem, equilibrium conditions Harmonic vibrations, simple, damped and forced. Mechanical waves, plane wave equation, phase velocity and group velocity, diffraction, interference, standing wave, rumble, Doppler effect. Prerequisites To study the course, students must know fundamental physics in the advanced matura exam scope in physics. Completing the Physics I course is necessary. Assessment methods Subject passing criteria Passing threshold Percentage of the final grade Final Exam 50.0% 50.0% 50.0% Midterm exam (2) 50.0% 50.0% 50.0% Recommended reading Basic literature Physics.vol.1, Poenstax Halliday, Resnick, Walker - fundamentals of Physics Supplementary literature Hennel, Szuszkiewicz - Zadania i problemy z fizyki t.1 i t.2 Adresy na platformie eNauczanie; Mechanika - Moodle ID: 30424 Hittps://enauczanie.go.du/literature Hennel, Suszkiewicz - Zadania i problemy z fizyki t.1 exp?/el-30424		K6_W03	and solve complex problems covering various branches of physics. It does not work				
and co-requisites physics. Completing the Physics I course is necessary. Assessment methods and criteria Subject passing criteria Passing threshold Percentage of the final grade Final Exam 50.0% 50.0% 50.0% Midterm exam (2) 50.0% 50.0% Recommended reading Basic literature Physics.vol.1, Poenstax Halliday, Resnick, Walker - fundamentals of Physics W.Demtroeder - Experimental Physics Supplementary literature Hennel, Szuszkiewicz - Zadania i problemy z fizyki t.1 i t.2 eResources addresses Adresy na platformie eNauczanie: Mechanika - Moodle ID: 30424 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=30424 Example issues/ example questions/ tasks being completed The moth moves along a curve whose length s is given by the formula s = s0exp (ct), where s0 and c - constants. Knowing that the acceleration vector a makes a constant angle with the path tangent at each point. Find the value of velocity, tangential acceleration, normal acceleration, the radius of curvature of the path as a function of the curve's arc length.	Subject contents	curvilinear motion, integration of equations of motion Laws of dynamics, equations of particle motion in any force field, the motion of a body with variable mass Principles of behaviour in mechanics, conservative and non-conservative field, Stokes's law Rotational motion, torque, angular momentum, conservation of angular momentum, central force field, Kepler's laws Rigid body, a centre of mass, a moment of inertia, Steiner theorem, equilibrium conditions Harmonic vibrations, simple, damped and forced. Mechanical waves, plane wave equation, phase velocity and group velocity, diffraction, interference, standing wave, rumble, Doppler					
and criteria Final Exam 50.0% 50.0% Midterm exam (2) 50.0% 50.0% Recommended reading Basic literature Physics.vol.1, Poenstax Halliday, Resnick, Walker - fundamentals of Physics W.Demtroeder - Experimental Physics Supplementary literature Hennel, Szuszkiewicz - Zadania i problemy z fizyki t.1 i t.2 eResources addresses Adresy na platformie eNauczanie: Mechanika - Moodle ID: 30424 https://enauczanie.gp.edu.pl/moodle/course/view.php?id=30424 Example issues/ example questions/ tasks being completed The moth moves along a curve whose length s is given by the formula s = s0exp (ct), where s0 and c - constants. Knowing that the acceleration vector a makes a constant angle with the path tangent at each point. Find the value of velocity, tangential acceleration, normal acceleration, the radius of curvature of the path as a function of the curve's arc length.	Prerequisites and co-requisites						
Indicating Social Social Midterm exam (2) 50.0% 50.0% Recommended reading Basic literature Physics.vol.1, Poenstax Halliday, Resnick, Walker - fundamentals of Physics W.Demtroeder - Experimental Physics Supplementary literature Hennel, Szuszkiewicz - Zadania i problemy z fizyki t.1 i t.2 eResources addresses Adresy na platformie eNauczanie: Mechanika - Moodle ID: 30424 https://enauczanie.gg.edu.pl/moodle/course/view.php?id=30424 Example issues/ example questions/ tasks being completed The moth moves along a curve whose length s is given by the formula s = s0exp (ct), where s0 and c - constants. Knowing that the acceleration vector a makes a constant angle with the path tangent at each point. Find the value of velocity, tangential acceleration, normal acceleration, the radius of curvature of the path as a function of the curve's arc length.		Subject passing criteria	Passing threshold	Percentage of the final grade			
Recommended reading Basic literature Physics.vol.1, Poenstax Halliday, Resnick, Walker - fundamentals of Physics Halliday, Resnick, Walker - fundamentals of Physics W.Demtroeder - Experimental Physics W.Demtroeder - Experimental Physics Supplementary literature Hennel, Szuszkiewicz - Zadania i problemy z fizyki t.1 i t.2 eResources addresses Adresy na platformie eNauczanie: Mechanika - Moodle ID: 30424 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=30424 Example issues/ example questions/ tasks being completed The moth moves along a curve whose length s is given by the formula s = s0exp (ct), where s0 and c - constants. Knowing that the acceleration vector a makes a constant angle with the path tangent at each point. Find the value of velocity, tangential acceleration, normal acceleration, the radius of curvature of the path as a function of the curve's arc length.		Final Exam	50.0%	50.0%			
Halliday, Resnick, Walker - fundamentals of Physics Halliday, Resnick, Walker - fundamentals of Physics W.Demtroeder - Experimental Physics Supplementary literature Hennel, Szuszkiewicz - Zadania i problemy z fizyki t.1 i t.2 eResources addresses Adresy na platformie eNauczanie: Mechanika - Moodle ID: 30424 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=30424 Example issues/ example questions/ tasks being completed The moth moves along a curve whose length s is given by the formula s = s0exp (ct), where s0 and c - constants. Knowing that the acceleration vector a makes a constant angle with the path tangent at each point. Find the value of velocity, tangential acceleration, normal acceleration, the radius of curvature of the path as a function of the curve's arc length.		Midterm exam (2)	50.0%	50.0%			
Supplementary literature Hennel, Szuszkiewicz - Zadania i problemy z fizyki t.1 i t.2 Supplementary literature Hennel, Szuszkiewicz - Zadania i problemy z fizyki t.1 i t.2 eResources addresses Adresy na platformie eNauczanie: Mechanika - Moodle ID: 30424 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=30424 Example issues/ example questions/ tasks being completed The moth moves along a curve whose length s is given by the formula s = s0exp (ct), where s0 and c - constants. Knowing that the acceleration vector a makes a constant angle with the path tangent at each point. Find the value of velocity, tangential acceleration, normal acceleration, the radius of curvature of the path as a function of the curve's arc length.		Basic literature					
eResources addresses Adresy na platformie eNauczanie: Mechanika - Moodle ID: 30424 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=30424 Example issues/ example questions/ tasks being completed The moth moves along a curve whose length s is given by the formula s = s0exp (ct), where s0 and c - constants. Knowing that the acceleration vector a makes a constant angle with the path tangent at each point. Find the value of velocity, tangential acceleration, normal acceleration, the radius of curvature of the path as a function of the curve's arc length.			W.Demtroeder - Experimental Physics				
eResources addresses Adresy na platformie eNauczanie: Mechanika - Moodle ID: 30424 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=30424 Example issues/ example questions/ tasks being completed The moth moves along a curve whose length s is given by the formula s = s0exp (ct), where s0 and c - constants. Knowing that the acceleration vector a makes a constant angle with the path tangent at each point. Find the value of velocity, tangential acceleration, normal acceleration, the radius of curvature of the path as a function of the curve's arc length.		Supplementary literature	Hennel, Szuszkiewicz - Zadania i problemy z fizyki t.1 i t.2				
example questions/ tasks being completed constants. Knowing that the acceleration vector a makes a constant angle with the path tangent at each point. Find the value of velocity, tangential acceleration, normal acceleration, the radius of curvature of the path as a function of the curve's arc length.		eResources addresses	Mechanika - Moodle ID: 30424				
	Example issues/ example questions/ tasks being completed	constants. Knowing that the acceleration vector a makes a constant angle with the path tangent at each point. Find the value of velocity, tangential acceleration, normal acceleration, the radius of curvature of the					
WORK placement Into applicable	Work placement	Not applicable					

Document generated electronically. Does not require a seal or signature.