

。 GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Engineering Mechanics, PG_00059035								
Field of study	Materials Engineering, Materials Engineering, Materials Engineering								
Date of commencement of studies	October 2022		Academic year of realisation of subject			2023/2024			
Education level	first-cycle studies		Subject group			Obligatory subject group in the field of study			
						research in the field of study			
Mode of study	Full-time studies		Mode of delivery			at the university			
Year of study	2		Language of instruction			Polish			
Semester of study	4		ECTS credits			5.0			
Learning profile	general academic profile		Assessment form			assessment			
Conducting unit	Division of Applied Mechanics and Biomechanics -> Institute of Mechanics and Machine Design -> Faculty of Mechanical Engineering and Ship Technology								
Name and surname	Subject supervisor		dr hab. inż. Kr	ci					
of lecturer (lecturers)	Teachers								
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Projec	t	Seminar	SUM	
	Number of study hours	30.0	15.0	15.0	0.0		0.0	60	
	E-learning hours included: 0.0								
Learning activity and number of study hours	Learning activity Participation ir classes includ		I didactic Participation in ed in study consultation hours		Self-study SUM		SUM		
	Number of study hours	60		5.0		60.0		125	
Subject objectives	Familiarizing students with the non-negligible knowledge about modeling methods in mechanics, the main concepts and theorems of statics. The introduction of methods for modeling sliding friction and rolling resistance. Introduction of the fundamental concepts, definitions and theorems of kinematics and dynamics of mechanical systems of rigid bodies.								
Learning outcomes	Course outcome		Subject outcome			Method of verification			
	K6_W05		has knowledge from the area of mechanics,			[SW1] Assessment of factual knowledge			
	K6_K01		is aware of the limits resulting from the use of modeling methods presented to him, and thus understands the need to improve professional and personal competences; is aware of their own limitations and knows when to turn to experts, is able to properly define priorities for the implementation of tasks specified by themselves or others			[SK5] Assessment of ability to solve problems that arise in practice			
	K6_U01		is able to use properly selected analytical methods to estimate loads acting on materials			[SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools			

Subject contents	Information on the organization of the course. Bibliography. Historical overview. Mechanics and its main topics. Modeling in mechanics. Concepts of real object, physical model, mathematical model, algorithm. Concepts of rigid body, material particle, concentrated force. Newtons laws. Primitive notions and axioms. Equivalent systems of forces. Net force for a concurrent et of forces and its torque. Net forque for a concurrent and general set of forces. Principal net force and principal net norce and principal net orgue. Degrees of freedom, constraints, reactions. Statically determinable system of forces, statically undeterminable system of forces, mechanisms. Statics. Basic concepts. Equilibrium conditions for planar systems. Particular cases of systems and their equilibrium conditions: concurrent system so forces parallel system. Particular cases of systems and their requilibrium conditions: concurrent system so forces: niternal and external forces. Gravity forces and coordinates of the gravity centers. Static momentum of inertia. Silding friction, belt friction, rolling resistance. Kinematics of a point: basic concepts and principles: position velocity acceleration. Particular cases of motion of the point: rectilinear uniform motion. Rectilinear motion with constant acceleration. Particular cases of motion of the point: rectilinear uniform motion. Rectilinear motion with constant acceleration, harmonic motion, slider-crank motion, rotational motion, rotational motion. Velocities and acceleration for a point of a body. Particular cases of rigid body. Basic concepts, principles. Institue and and sa a combination of a body as a combination of translational and rotational motion, planar motion. General motion of a body as a combination of translational and rotational motion. Temporal centre of rotation. Kinematics of gears, gear transmission ratio. Relative motion and Coriolis acceleration. Basic concepts, principal energy and potential energy of bodies.						
Prerequisites and co-requisites	Completed course of Mathematics Completed course of Physics Main attention set on basic knowledge about geometry, trigonometry, vector calculus (analysis), matrix calculus, abilities in integrations and derivation of basic mathematical formulas						
Assessment methods	Subject passing criteria	Passing threshold	Percentage of the final grade				
and criteria	qualifying test of the theory	56.0%	34.0%				
	Midterm colloquium	56.0%	66.0%				
Recommended reading	Basic literature	1. Wittbrodt E., Sawiak S.: Mechanika ogólna. Teoria i zadania. Wyd. PG, Gdańsk 2005 2. Sawiak S., Wittbrodt E.: Mechanika. Wybrane zagadnienia. Skrypt PG, Gdańsk 2003 3. Leyko J.: Mechanika ogólna, t. I i 2, PWN, Warszawa 1980 4. Niezgodziński M.E., Niezgodziński T.: Zbiór zadań z mechaniki ogólnej, PWN, Warszawa 1997 5. Dyląg Z.,Jakubowicz A., Orłoś Z.: Wytrzymałość materiałów, Warszawa WNT, t.I 1996, t.II 1997					
	Supplementary literature	re 1. Osiński Z.: Mechanika ogólna, t. I i 2, PWN, Warszawa 1987 2. Leyko J., Szmelter J.: Zbiór zadań z mechaniki ogólnej, t. I i 2, PWN, Warszawa 1976 3. Mieszczerski I. W.: Zbiór Zadań z mechaniki, PWN, Warszawa 4. Niezgodziński T.: Mechanika ogólna. WNT, Warszawa 1999 5. Nizioł J.:Metodyka rozwiązywania zadań z mechaniki. WNT, Warszawa 2002					
	eResources addresses Adresy na platformie eNauczanie:						
Example issues/ example questions/ tasks being completed	Determination of reaction forces for the system of known geometrical structure and known structure of load Determination of speed of some selected points at a given mechanism						
	Datance between the kinetic and po						
work placement							

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