



## Subject card

Subject name and code	Mechanics, PG_00038082						
Field of study	Automation, Robotics and Control Systems						
Date of commencement of studies	October 2020	Academic year of realisation of subject				2020/2021	
Education level	first-cycle studies	Subject group					
Mode of study	Full-time studies	Mode of delivery				blended-learning	
Year of study	1	Language of instruction				Polish None	
Semester of study	1	ECTS credits				4.0	
Learning profile	general academic profile	Assessment form				assessment	
Conducting unit	Department of Mechatronics and High Voltage Engineering -> Faculty of Electrical and Control Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor		prof. dr hab. inż. Marek Krawczuk				
	Teachers		prof. dr hab. inż. Marek Krawczuk dr inż. Łukasz Doliński				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	30.0	0.0	0.0	0.0	60
	E-learning hours included: 30.0						
MECHANIKA [2020/21] - Moodle ID: 6319 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=6319">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=6319</a>							
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		4.0		36.0	100
Subject objectives	Learning the basic principles of solid state mechanics and their practical applications						
Learning outcomes	Course outcome		Subject outcome			Method of verification	
	K6_W02		Student determines the conditions of equilibrium of basic force systems and defines types of stresses			[SW1] Assessment of factual knowledge	
	K6_U02		The student is able to independently solve simple problems in statics and strength of materials.			[SU3] Assessment of ability to use knowledge gained from the subject	
Subject contents	Basic concepts. Axioms of statics, Primary concepts Force as a vector, Zero two, Theorem on moving a force along an action line, The resultant of two non-parallel forces on a plane, Distribution of a force into two components with given directions of action, Principle of action and reaction, Types of constraints, Equilibrium of a convergent system of forces, Systems of forces, Analytical representation of force, Principal vector, Equilibrium conditions of a convergent planar and spatial force system, Theorem about three forces, Pair of forces. Moment of a pair of forces, Composition of two parallel forces, Pair of forces. Moment of a pair of forces, Theorem on pairs of forces, Combining pairs of forces in one plane, Moment of force about a point and an axis, Moment of force about a point (pole), Moment of force about an axis, Theorem about parallel force displacement, Equilibrium of a plane, free and spatial system of forces, Reduction of plane and spatial, any system of forces, Cases of reduction of plane and spatial, any system of forces, Conditions of plane and spatial equilibrium, any system of forces, Centers of gravity, Center of parallel forces, Center of gravity of solids, plane figures, lines, Friction, Static friction. The force of static friction, Kinetic friction, Tendon friction, Rolling friction, Basic assumptions and strength hypotheses, Types of loads, Deformations, Stresses, Elements of the theory of elasticity, Load sharing. Principle de Saint-Venant, Fundamentals of structure design, Moments of inertia of figures, Tensile and compression of straight bars, Technological shear, Torsion of bars, Bending, Strength, Bending with tension or compression, Bending with torsion, Fatigue strength, Basic concepts of fatigue strength, Fatigue strength for symmetrical and asymmetrical cycles, Factors influencing the change in fatigue strength						
Prerequisites and co-requisites	Basic knowledge of algebra and trigonometry						
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	Credit for theory and exercises		60.0%		100.0%		
Recommended reading	Basic literature		M.Krawczuk Mechanika Ciała Stałego Wydawnictwo PG 2005				
	Supplementary literature		Academic textbooks on solid state statics and strength of materials				

	eResources addresses	
Example issues/ example questions/ tasks being completed	Equilibrium conditions for any system of forces	
Work placement	Not applicable	