



Subject card

Subject name and code	Kinematic peculiarities in the operation of industrial robots, PG_00056134						
Field of study	Mechatronics						
Date of commencement of studies	October 2024	Academic year of realisation of subject			2026/2027		
Education level	first-cycle studies	Subject group					
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	3	Language of instruction			Polish		
Semester of study	6	ECTS credits			2.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Institute of Naval Architecture -> Faculty of Mechanical Engineering and Ship Technology -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Aleksander Kniat					
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	0.0	0.0	30
	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	30	0.0		0.0	30	
Subject objectives	Presentation of motions' limitations of a 6 joints arm of industrial robot.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K6_W08] knows and understands design and production processes of elements and simple mechatronic devices	knows how to prepare the control program for an industrial robot			[SW3] Assessment of knowledge contained in written work and projects		
	[K6_U06] is able to identify and formulate specification of simple, practical engineering tasks, distinctive for mechatronics	does simple task with an industrial robot			[SU1] Assessment of task fulfilment		
	[K6_W10] has knowledge about development trends in the field of engineering and technology sciences and scientific disciplines: Mechanical Engineering, Automation, Electronics, Electrical Engineering and Space Technologies, adequate for Mechatronics course	understands principles of an industrial robot functioning			[SW2] Assessment of knowledge contained in presentation [SW1] Assessment of factual knowledge		
	[K6_W11] has knowledge about the life cycle of mechatronic systems and objects	understands an industrial robot's construction and knows how to use it in practical applications			[SW2] Assessment of knowledge contained in presentation [SW1] Assessment of factual knowledge		
	[K6_U05] is able to use properly chosen tools to compare design solutions of elements and mechatronics systems according to given application and economic criteria (e.g. power demand, speed, costs)	is able to assess if an industrial robot can be applied in particular task (power, speed, accuracy etc.)			[SU2] Assessment of ability to analyse information		
Subject contents	Course content – lecture 1. Kinematics of an arm of industrial robot (recall), 2. Generating tool path (CAM program), 3. Transforming a tool path into a control program in robot's language (using simulator), 4. Singularities (definition, symptoms), 5. Methods to resolve singularities.						

Prerequisites and co-requisites	basic knowledge about automation and kinematics		
	ability to use programs which visualize scenes in 3D space		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
		60.0%	100.0%
Recommended reading	Basic literature	Honczarenko Jerzy, "Roboty przemysłowe", WNT 2011 Groover Mikell P., "Industrial Robotics Technology, Programming and Applications", International Edition, McGraw-Hill, 1987	
	Supplementary literature	Pires Norberto J., "Industrial Robots Programming", Springer-Verlag GmbH 2006	
	eResources addresses		
Example issues/ example questions/ tasks being completed			
Practical activities within the subject	Not applicable		

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