



## Subject card

Subject name and code	, PG_00056134						
Field of study	Mechatronics						
Date of commencement of studies	October 2023	Academic year of realisation of subject			2025/2026		
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 Ocean Engineering and Ship Technology -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Aleksander Kniat				
	Teachers						
Lesson types and methods of instruction	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_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			[SW1] Assessment of factual knowledge [SW2] Assessment of knowledge contained in presentation		
	[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			[SW1] Assessment of factual knowledge [SW2] Assessment of knowledge contained in presentation		
	[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		
	[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_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		
Subject contents	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	Adresy na platformie eNauczenie:	
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		