



## Subject card

Subject name and code	, PG_00056118						
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 Manufacturing and Materials Technology -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Grzegorz Rogalski				
	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	The aim of the course is to familiarize students with the current state of knowledge in the field of automation of welding processes and related and accompanying elements.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[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	The student is able to determine the degree of the life cycle of an automated or robotic system and predict the possibility of its modification			[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)	The student is able to make the right choice of the automation and robotization process based on the analysis of input data			[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject		
	[K6_U06] is able to identify and formulate specification of simple, practical engineering tasks, distinctive for mechatronics	The student is able to identify innovative solutions that allow not to increase the efficiency of welding processes through the application of significant variables of a given process.			[SU3] Assessment of ability to use knowledge gained from the subject		
	[K6_W08] knows and understands design and production processes of elements and simple mechatronic devices	The student is able to identify innovative solutions that allow not to increase the efficiency of welding processes through the application of significant variables of a given process.			[SW2] Assessment of knowledge contained in presentation		
Subject contents	As part of the course, students learn the content related to the automation and robotization of welding processes. They get to know the current instrumentation and the requirements for this type of instrument. They will learn how to increase the efficiency of welding.						
Prerequisites and co-requisites	Basic knowledge of welding processes						

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Laboratory	56.0%	50.0%
	Lecture	56.0%	50.0%
Recommended reading	Basic literature	<p>Dobaj E.: Maszyny i urządzenia spawalnicze, WNT Wydawnictwa Naukowo-Techniczne, 2014</p> <p>Pilarczyk J.: Poradnik inżyniera Spawalnictwo Tom 1, Tom 2 Wydanie II, Wydawnictwo: Naukowe PWN, 2017</p> <p>Chmielewski T.: Projektowanie procesów technologicznych spawalnictwo, Oficyna Wydawnicza Politechniki Warszawskiej, 2013</p> <p>Klimpel A.: Technologie laserowe w spawalnictwie, Wydawnictwo Politechniki Śląskiej, Gliwice, 2011</p> <p>Ferenc K.: Podręcznik spawania. Zagadnienia ogólne. Agencja Wydawnicza SIMP, 2018</p>	
	Supplementary literature	None	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	<ol style="list-style-type: none"> <li>1. Give the methods of increasing the efficiency of the MIG / MAG welding process using robotic welding</li> <li>2. Give the methods of automation and robotization of welding with the TIG process</li> <li>3. Explain the principles of building robotic stations with the observance of safety rules</li> <li>4. Provide the methods of manipulating the object welded on the robotic station</li> <li>5. Suggest a method of fixing pipe elements on a mechanized TIG welding stand</li> <li>6. What are the welding positioners for, provide typical solutions</li> </ol>		
Work placement	Not applicable		