GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	, PG_00056118						
Field of study	Mechatronics						
Date of commencement of studies	October 2021		Academic year of realisation of subject		2023/2024		
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 None		
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		dr hab. inż. Grzegorz Rogalski dr inż. Michał Landowski				

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_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
	[K6_W10] has a basic knowledge about development trends in terms of engineering and technical sciences and scientific disciplines: Mechanical Engineering, Automation, Electronics and Electrical Engineering, adequate for Mechatronics curse	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 choosen tools to compare design solutions of elements and mechatronics systems according to given application and economic crtierions (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

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	Dobaj E.: Maszyny i urządzenia spawalnicze, WNT Wydawnictwa Naukowo-Techniczne, 2014
		Pilarczyk J.: Poradnik inżyniera Spawalnictwo Tom 1, Tom 2 Wydanie II, Wydawnictwo: Naukowe PWN, 2017
		Chmielewski T.: Projektowanie procesów technologicznych spawalnictwo, Oficyna Wydawnicza Politechniki Warszawskiej, 2013
		Klimpel A.: Technologie laserowe w spawalnictwie, Wydawnictwo Politechniki Śląskiej, Gliwice, 2011
		Ferenc K.: Podręcznik spawania. Zagadnienia ogólne. Agencja Wydawnicza SIMP, 2018
	Supplementary literature	None
	eResources addresses	Adresy na platformie eNauczanie: Automatyzacja procesów spawalniczych, W, L , Mechatronika, Sem.6, Lato 2023/2024 - Moodle ID: 36542 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=36542

Example issues/ example questions/ tasks being completed	1. Give the methods of increasing the efficiency of the MIG / MAG welding process using robotic welding
	2. Give the methods of automation and robotization of welding with the TIG process
	3. Explain the principles of building robotic stations with the observance of safety rules
	4. Provide the methods of manipulating the object welded on the robotic station
	5. Suggest a method of fixing pipe elements on a mechanized TIG welding stand
	6. What are the welding positioners for, provide typical solutions

Work placement	Not applicable