



## Subject card

Subject name and code	Welding processes and devices, PG_00055242						
Field of study	Management and Production Engineering						
Date of commencement of studies	October 2021		Academic year of realisation of subject		2023/2024		
Education level	first-cycle studies		Subject group		Optional subject group Subject group related to scientific research in the field of study		
Mode of study	Full-time studies		Mode of delivery		at the university		
Year of study	3		Language of instruction		Polish not applicable		
Semester of study	5		ECTS credits		3.0		
Learning profile	general academic profile		Assessment form		exam		
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. Dariusz Fydrych				
	Teachers		dr hab. inż. Grzegorz Rogalski  mgr inż. Adrian Wolski  dr inż. Jacek Haras  mgr inż. Anna Janeczek  dr hab. inż. Dariusz Fydrych  dr inż. Aleksandra Świerczyńska				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	15.0	0.0	0.0	45
	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	45		4.0		26.0	75
Subject objectives	The aim of the course is to familiarize students with the processes of bonding and cutting construction materials. They will also learn about the construction of devices used in joining processes and the elements of electrical engineering related to this area.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_W06] has knowledge of the life cycle of products and mechanical devices and systems, in the field of machine parts manufacturing techniques, as well as the possibilities and trends in the development of machines and production devices and process control		The student is able to choose the appropriate device for the implementation of a given bonding and cutting process.		[SW2] Assessment of knowledge contained in presentation		
	[K6_K01] feels the need for self-realization by learning throughout life, is looking for modern and innovative solutions in their actions, is able to think creatively and act in an entrepreneurial way		Based on the input data of the actual bonding and cutting process, the student is able to analyze it properly in order to solve a practical application problem.		[SK4] Assessment of communication skills, including language correctness [SK5] Assessment of ability to solve problems that arise in practice		
	[K6_U08] can assess the usefulness of routine methods and tools for solving practical production tasks in measuring in order to supervise processes and analyze the functioning of production systems		The student is able to choose the right bonding and cutting process in relation to the required application, which takes into account various groups of construction materials		[SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools		

Subject contents	As part of the course, students learn the basic welding and cutting processes such as: MMA, TIG, MIG / MAG, SAW, OAW, brazing and soldering, oxygen cutting, plasma cutting, laser cutting. They learn about the construction of bonding devices and the main fundamental variables of the discussed processes together with elements of electrical engineering.		
Prerequisites and co-requisites	Basic knowledge of materials science and electrical engineering is required		
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	Klimpel A.: Spawanie zgrzewanie i cięcie metali, Wydawnictwo WNT, 2009  Walczak W. i inni: Spawalnictwo ćwiczenia laboratoryjne. Wyd. Politechniki Gdańskiej, Gdańsk, 2000  Ferenc K.: Spawalnictwo. WNT Warszawa 2007.  Ferenc K.: Podręcznik spawania. Zagadnienia ogólne. Agencja Wydawnicza SIMP, 2018  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	
	Supplementary literature	Not require	
	eResources addresses	Adresy na platformie eNauczanie: Procesy i urządzenia spajania, Zarządzanie i inżynieria produkcji, W, L, sem. 5, zima 2023/2024 - Moodle ID: 33944 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=33944">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=33944</a>	
Example issues/ example questions/ tasks being completed	1. Explain the concept of static characteristics of an arc \		
	2. What is electric arc self-regulation		
	3. Explain the differences between the various bonding processes (welding, fusing, soldering)		
	4. What do the abbreviations SAW, TIG, MMA mean?		
	5. What type of device should be selected for plasma cutting of 5 mm thick stainless steel elements?		
	6. provide the main fundamental variables for the MIG / MAG welding process.		
	7. What is the distance of the electric contact to the base material and what is its influence on the welding process.		
	8. Explain the role of shielding gases.		
Work placement	Not applicable		