



## Subject card

Subject name and code	Welding Processes Equipment, PG_00055491						
Field of study	Mechanical 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 None		
Semester of study	5	ECTS credits			4.0		
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 inż. Jacek Haras mgr inż. Adrian Wolski mgr inż. Anna Janeczek dr hab. inż. Grzegorz Rogalski dr hab. inż. Dariusz Fydrych				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	15.0	15.0	0.0	60
	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	60	4.0		36.0	100	
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_W03] possesses and is able to practically apply the knowledge on the construction, properties and testing methods of construction materials		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.		[SW3] Assessment of knowledge contained in written work and projects		
[K6_U10] is able to formulate the principles of selecting a material for a construction, ensuring the correct operation of a device		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		[SU3] Assessment of ability to use knowledge gained from the subject [SU5] Assessment of ability to present the results of task			
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%		30.0%		
	Project		56.0%		30.0%		
	Lecture		56.0%		40.0%		

Recommended reading	Basic literature	<p>Klimpel A.: Spawanie zgrzewanie i cięcie metali, Wydawnictwo WNT, 2009</p> <p>Walczak W. i inni: Spawalnictwo ćwiczenia laboratoryjne. Wyd. Politechniki Gdańskiej, Gdańsk, 2000</p> <p>Ferenc K.: Spawalnictwo. WNT Warszawa 2007.</p> <p>Ferenc K.: Podręcznik spawania. Zagadnienia ogólne. Agencja Wydawnicza SIMP, 2018</p> <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>
	Supplementary literature	<p>Tomasz Chmielewski: Projektowanie procesów technologicznych spawalnictwo, Oficyna Wydawnicza Politechniki Warszawskiej, 2013</p> <p>Jarosław Ferenc, Kazimierz Ferenc: Spawalnicze gazy osłonowe i palne, WNT, Warszawa, 2013</p>
	eResources addresses	
Example issues/ example questions/ tasks being completed	<ol style="list-style-type: none"> <li>1. Explain the concept of static characteristics of an arc</li> <li>2. What is electric arc self-regulation</li> <li>3. Explain the differences between the various bonding processes (welding, fusing, soldering)</li> <li>4. What do the abbreviations SAW, TIG, MMA mean?</li> <li>5. What type of device should be selected for plasma cutting of 5 mm thick stainless steel elements?</li> <li>6. provide the main fundamental variables for the MIG / MAG welding process.</li> <li>7. What is the distance of the electric contact to the base material and what is its influence on the welding process.</li> <li>8. Explain the role of shielding gases.</li> </ol>	
Work placement	Not applicable	