



Subject card

Subject name and code	Advanced bonding processes, PG_00059492						
Field of study	Management and Production Engineering						
Date of commencement of studies	February 2023		Academic year of realisation of subject		2022/2023		
Education level	second-cycle studies		Subject group		Obligatory subject group in the field of study 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	1		Language of instruction		Polish None		
Semester of study	1		ECTS credits		4.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Zakład Technologii Materiałów Konstrukcyjnych i Spajania -> 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. Aleksandra Świerczyńska dr inż. Michał Landowski				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	15.0	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		10.0		45.0	100
Subject objectives	Familiarize students with advanced bonding and related bonding processes						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K7_W02] has extended knowledge covering key issues characterizing production processes	Students learn in detail selected bonding processes in the theoretical and practical scope. They learn about the relationships between the individual welding parameters and their impact on the properties of the joints.	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects
	[K7_K04] is aware of the social role of the university graduate, and especially understands the need to formulate and communicate to society - incl. through the mass media - information and opinions on technological achievements and other aspects of an engineer's activity; makes efforts to provide such information and opinions in a generally comprehensible manner, justifying different points of view	Students are able, on the basis of the information obtained, to determine the directions of development in a given technological process and to provide the necessary information to achieve the expected results.	[SK4] Assessment of communication skills, including language correctness [SK5] Assessment of ability to solve problems that arise in practice
	[K7_U02] demonstrates the ability to write a research paper in Polish and a short scientific report in a foreign language on the basis of own research	Students are able, on the basis of the obtained information, to determine the influence of individual process variables on the properties of joints. They are able to analyze the obtained results and draw the right conclusions, which gives them the opportunity to create an appropriate scientific and technical report.	[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools
Subject contents	Basic concepts and definitions. Classification of welding processes. Laser welding. Plasma welding. Electron beam welding. Modern variations of welding with classical processes. Solid state bonding. Special bonding processes.		
Prerequisites and co-requisites	Basic information on bonding processes		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Laboratory	60.0%	40.0%
	Lecture: Exam / Assessment	60.0%	60.0%
Recommended reading	Basic literature	<p>Pilarczyk J. (red.): Poradnik inżyniera. Spawalnictwo. tom I. Wydawnictwo Naukowe PWN, Warszawa.</p> <p>Pilarczyk J. (red.): Poradnik inżyniera. Spawalnictwo. tom II. Wydawnictwo Naukowe PWN, Warszawa.</p>	
	Supplementary literature	<p>Klimpel A.: Technologie laserowe. Spawanie, napawanie, stopowanie, obróbka cieplna i cięcie. Wydawnictwo Politechniki Śląskiej, Gliwice.</p>	
	eResources addresses	<p>Adresy na platformie eNauczanie:</p> <p>Zaawansowane procesy spajania, W, P, ZIP sem. 1 Lato 2022 2023 , PG_00059492, - Moodle ID: 30257</p> <p>https://enauczanie.pg.edu.pl/moodle/course/view.php?id=30257</p>	

Example issues/ example questions/ tasks being completed	<p>Explain the formation of high-temperature plasma</p> <p>Determine the influence of the fundamental variables of the FCAW welding process on the geometry of welds and overlays</p> <p>Explain the use of orbital welding with process 141 and 142</p> <p>Draw an exemplary course of vacuum brazing in the Temperature - time system</p>
Work placement	Not applicable