



Subject card

Subject name and code	Advanced welding processes, PG_00064859						
Field of study	Mechanical Engineering						
Date of commencement of studies	February 2025	Academic year of realisation of subject				2025/2026	
Education level	second-cycle studies	Subject group				Specialty 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	1	Language of instruction				English	
Semester of study	2	ECTS credits				3.0	
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 inż. Aleksandra Świerczyńska					
	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	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	5.0		25.0	75	
Subject objectives	The aim of the course is to familiarize students with advanced welding processes						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K7_U13] evaluates the feasibility and potential for utilizing new technical and technological achievements in accomplishing tasks characteristic for the field of study	The student is able to search for information on advanced welding methods.			[SU4] Assessment of ability to use methods and tools [SU2] Assessment of ability to analyse information		
	[K7_W01] explains and describes, on the basis of general knowledge of the scientific disciplines forming the theoretical basis of Mechanics and Mechanical Engineering, the structure and principles of operation of mechanical systems and processes	The student knows the methods of increasing the efficiency of welding processes.			[SW1] Assessment of factual knowledge		
	[K7_W11] interprets social, economic, legal (including industrial and intellectual property laws), and other non-technical aspects of engineering activities, and includes them into engineering practice	The student understands the impact of the selected welding technology on non-technical production aspects.			[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge		
	[K7_U03] plans and carries out experimental investigations to determine the parameters of devices, processes or systems in the field of Mechanical Engineering and Mechanical Engineering, appropriately selects methods, techniques and tools, interprets results and estimates measurement errors	The student understands the impact of welding methods on the properties of structures.			[SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information		
Subject contents	Basic terms and definitions. Classification of welding processes. Advanced methods of TIG welding. FCAW welding. Gases used in advanced welding methods. Laser welding. Plasma welding. Electron beam welding. Hybrid welding. Solid state welding. Special welding processes						

Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Laboratory tests	60.0%	20.0%
	Project	60.0%	20.0%
	exam	60.0%	60.0%
Recommended reading	Basic literature	Norrish, J. (2006). Advanced Welding Processes. Elsevier.	
	Supplementary literature	<p>Welding metallurgy and weldability of stainless steels / John C. Lippold, Damian J. Kotecki</p> <p>Metallurgy of welding / J. F. Lancaster.</p> <p>Principles of welding technology / L. M. Gourd.</p> <p>Welding, brazing, and soldering / Scott D. Henry [et al.]; prepared under the direction of the ASM International Handbook Committee.</p> <p>Procedure Handbook of Arc Welding</p> <p>How To Weld (Motorbooks Workshop) / Todd Bridigum</p>	
	eResources addresses	Adresy na platformie eNauczenie:	
Example issues/ example questions/ tasks being completed	Describe the welding process.State the advantages of the welding process.Draw a diagram of the process implementation.		
Work placement	Not applicable		

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