GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Welding Technology, PG_00040187		
Field of study	Mechanical Engineering, Mechanical Engineering		
Date of commencement of studies	October 2020	Academic year of realisation of subject	2021/2022
Education level	first-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	2	Language of instruction	English
Semester of study	4	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Materials Engineering and Bonding -> Faculty of Mechanical Engineering and Ship Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Aleksandra Świerczyńska	
	Teachers	dr inż. Aleksandra Świerczyńska dr hab. inż. Dariusz Fydrych dr hab. inż. Jacek Tomków	

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						
	Adresy na platformie eNauczanie:						

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	6.0	39.0	75

Subject objectives	Presentation of the basics of welding technology of metals.

Learning outcomes

Course outcome	Subject outcome	Method of verification
K6_W03	The student knows the basic methods of joining metals.	[SW1] Assessment of factual knowledge
K6_U10	The student is able to independently assess the suitability of the welding method for a given application.	[SU3] Assessment of ability to use knowledge gained from the subject

Subject contents	Classification of welding and joining processes. Outline of welding thermal cycles. Phase transformations in the weld and heat affected zone. Definition of weldability. Basic and supplementary materials for welding. Basics of welding technology specification. Gas welding. Manual arc welding (MMA). Submerged arc welding under flux. TIG welding. Shielding gases. Gas-shielded arc welding MIG / MAG methods. Flux cored arc welding. Pulse arc welding. Laser welding, plasma and electron beam welding. Resistance pressure welding, spot and linear pressure welding, upset and flash welding. Basic parameters of the process. Other methods of pressure welding. Thermal cutting methods: oxygen cutting, plasma cutting. Cutting laser beam. Deformation and welding stress and methods for their reduction. Inspection of welded joints, imperfections definitions and methods for their detection. LABORATORY Manual arc welding with coated electrodes, automatic submerged arc welding. Gas-shielded arc welding. Pressure resistance welding. Gas welding and cutting. Structure of welded joints. Imperfections of welded joints
Prerequisites and co-requisites	Fundamentals of Materials Science

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Written test	56.0%	80.0%
	Laboratory short tests	56.0%	20.0%
Recommended reading	Basic literature	1. Klimpel A.: Technologia spawania i cięcia metali. Wyd. Politechniki Śląskiej, Gliwice 1997. 2. Walczak W. i inni: Spawalnictwo ćwiczenia laboratoryjne. Wyd. Politechniki Gdańskiej, Gdańsk, 2000. 3. Klimpel A., Mazur M.: Podręcznik spawalnictwa. Wyd. Politechniki Śląskiej, Gliwice 2004.	
	Supplementary literature	1. Ferenc K.: Spawalnictwo. WNT Warszawa 2007. 2. Ferenc K., Ferenc J.: Spawalnicze gazy osłonowe i palne. WNT Warszawa 2005. 3. Poradnik Inżyniera Spawalnictwo, tom I i II, WNT Warszawa, 2005	
	eResources addresses		
Example issues/ example questions/ tasks being completed	Describe the welding process.		
Work placement	Not applicable		