



Subject card

Subject name and code	Welding Technology, PG_00045054						
Field of study	Ocean Engineering, Ocean 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		Polish		
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 hab. inż. Dariusz Fydrych				
	Teachers		mgr inż. Dariusz Duda dr hab. inż. Dariusz Fydrych				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	30.0	0.0	0.0	45
	E-learning hours included: 0.0						
	Address on the e-learning platform: https://enauczanie.pg.edu.pl/moodle/course/view.php?id=10261 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	45		5.0		25.0	75
Subject objectives	Presentation of the basics of welding technology of metals						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_W05] has an organized knowledge on design, construction and operation of ocean technology objects and systems		The student defines the concept of weldability and classifies welding technologies.		[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects		
	[K6_U05] can formulate a simple engineering task and its specification within the range of design, construction and operation of ocean technology objects and systems		The student is able to use information and technological, material and IT tools.		[SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools [SU5] Assessment of ability to present the results of task		
Subject contents	<p>COURSE CONTENT</p> <p>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.</p> <p>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.</p> <p>Resistance pressure welding, spot and linear pressure welding, upset and flash welding. Basic parameters of the process. Other methods of pressure welding.</p> <p>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.</p> <p>LABORATORY PRACTICAL TRAINING</p> <p>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</p>						

Prerequisites and co-requisites	Knowledge of basics of materials science		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Laboratory test	60.0%	40.0%
	Written test	60.0%	60.0%
Recommended reading	Basic literature	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	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 process of welding		
Work placement	Not applicable		