



Subject card

Subject name and code	Basics of Welding, PG_00039770						
Field of study	Materials Engineering, Materials Engineering, Materials 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		
Semester of study	5	ECTS credits			4.0		
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. Adrian Wolski mgr inż. Anna Janeczek Dominika Kwidzińska dr hab. inż. Dariusz Fydrych dr inż. Aleksandra Świerczyńska					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	15.0	0.0	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		50.0		100
Subject objectives	Obtaining of knowledge about basics of welding technologies						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	K6_U06	Student critically evaluates assumption of various material technologies. Student defines notion: weldability. He differentiates processes of welding and interprets mechanisms of creation of welded joints. Student prepares basic assumptions of welding process and interprets results of quantitative and qualitative tests of evaluation of weldability of metals.			[SU4] Assessment of ability to use methods and tools [SU2] Assessment of ability to analyse information		
	K6_W03	Recognize the constructional materials			[SW1] Assessment of factual knowledge		
	K6_K01	Student is able to plan and run projects.			[SK5] Assessment of ability to solve problems that arise in practice [SK3] Assessment of ability to organize work		

Subject contents	<p>Lecture:</p> <p>Introduction: basic notions. Welding processes. Characteristics and properties of welded joints. Manual metal arc welding. Submerged arc welding. Oxyacetylene welding. Gas metal arc welding (MIG/MAG). Gas tungsten arc welding (TIG). Plasma arc Welding. Laser beam Welding. Electron beam Welding. Resistance welding, Friction Welding, Explosive Welding, Welding of plastics. Soldering and Brazing. Induction soldering, dip soldering, electro-brazing, gas brazing, torch brazing, Furnace brazing. Braze welding. Thermal cutting methods. Quality in welding. Welding defects.</p> <p>Laboratory:</p> <p>Manual metal arc welding. Submerged arc welding Gas metal arc welding (MIG/MAG), gas tungsten arc welding (TIG) Bonding of metals Oxyacetylene welding, brazing, thermal cutting, gouging Characteristics and properties of welded joints Evaluation of weldability of steel Inspection of quality of welded joints.</p>								
Prerequisites and co-requisites	<p>Metallography Physics Mathematics</p>								
Assessment methods and criteria	<table border="1"> <thead> <tr> <th data-bbox="454 891 794 920">Subject passing criteria</th> <th data-bbox="799 891 1139 920">Passing threshold</th> <th data-bbox="1144 891 1482 920">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="454 927 794 956">test</td> <td data-bbox="799 927 1139 956">60.0%</td> <td data-bbox="1144 927 1482 956">100.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	test	60.0%	100.0%
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Recommended reading	<p>Basic literature</p>	<ol style="list-style-type: none"> 1. Klimpel A.: Technologia spawania i cięcia metali. WNT. Warszawa 1999. 2. Walczak W. (red.): Spawalnictwo. Ćwiczenia laboratoryjne. Wydawnictwo Politechniki Gdańskiej. Gdańsk, 2000. 3. Butnicki S.: Spawalność i kruchość stali. Wydawnictwo WNT. Warszawa 1991. 4. Pilarczyk J., Pilarczyk J.: Spawanie i napawanie elektryczne metali. Wydawnictwo Śląsk, Katowice 1996. 5. Dobrzański A.L.: Podstawy nauki o materiałach i materiałoznawstwo. Materiały inżynierskie i podstawy projektowania materiałów. WNT. 2002. 							
	<p>Supplementary literature</p>	<ol style="list-style-type: none"> 1. Klimpel A.: Napawanie i natryskiwanie cieplne. WNT. Warszawa 2000. 2. Czajkowski H., Walczak W.: Zgrzewanie wybuchowe metali. WNT. Warszawa 1970. 3. Radomski T., Ciszewski A.: Lutowanie. WNT. Warszawa 1971. 4. Burakowski T., Wierzchoń.: Inżynieria powierzchni metali. WNT. Warszawa 1995 							
	<p>eResources addresses</p>	<p>Adresy na platformie eNauczanie: Podstawy spawalnictwa, Inżynieria materiałowa, W, L, sem. 5, zima 2023/2024 - Moodle ID: 33539 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=33539</p>							

Example issues/ example questions/ tasks being completed	Characteristics of welding methods. Characteristics of brazing methods. Characteristics of soldering methods.
Work placement	Not applicable

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