



Subject card

Subject name and code	, PG_00058714						
Field of study	Materials Engineering, Materials Engineering						
Date of commencement of studies	February 2024		Academic year of realisation of subject		2024/2025		
Education level	second-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	1		Language of instruction		Polish		
Semester of study	2		ECTS credits		3.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Division of Materials Science and Technology -> Institute of Manufacturing and Materials Technology -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Krzysztof Krzysztofowicz				
	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	Gaining in-depth knowledge of heat and thermo-chemical treatment processes						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	K7_U03		The student is able to formulate a research hypothesis, design an experiment necessary to confirm it		[SU1] Assessment of task fulfilment		
	K7_U04		The student is able to make a detailed analysis of the obtained results and to develop them in the form of a technical report		[SU1] Assessment of task fulfilment		
	K7_K01		the student understands the need for lifelong learning		[SK5] Assessment of ability to solve problems that arise in practice		
	K7_W01		the student has an extended knowledge of the fields of science and scientific disciplines relevant to materials science		[SW3] Assessment of knowledge contained in written work and projects		
	K7_W05		the student knows the basic methods, techniques, tools and materials used to solve complex engineering tasks		[SW3] Assessment of knowledge contained in written work and projects		
Subject contents	<p>Lecture: Design and modeling of thermo-chemical treatment processes in relation to plastics iron-based metal. Diffusion saturation with non-metallic elements. Nitriding conventional and ionic, selective nitriding, sulphitonitriding. Conventional carburizing, high-temperature and ionic, diffusion drilling. Diffusion saturation with metallic elements. Diffusion chrome plating, aluminization, diffusion titanation and vanadation. Disadvantages in heat-chemical treatment.</p> <p>Project: Design of the HT process</p> <p>Laboratory: Hardening, tempering, thermo-chemical treatment</p>						
Prerequisites and co-requisites							

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Laboratory - completeness	50.0%	50.0%
	Project - problem solution	50.0%	50.0%
Recommended reading	Basic literature	1. Burakowski T., Roliński E., Wierzchoń T.: Inżynieria powierzchni metali. WPW, Warszawa 1992. 2. Jarzębski M.Z.: Dyfuzja w metalach. Śląsk. Katowice 1976. 3. Praca zbiorowa.: Metaloznawstwo. Skrypt Politechniki Gdańskiej, Gdańsk 1991. 4. Poradnik inżyniera. Obróbka cieplna stopów żelaza. WNT, Warszawa 1977.	
	Supplementary literature	Askeland. D, Phules P.: The science and engineering of materials. Thomson 2008	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	1. Quenching 2. Tempering 3. Carbonizing		
Work placement	Not applicable		

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