

於。GDAŃSK UNIVERSITY 奶 OF TECHNOLOGY

Subject card

Subject name and code	Fundamentals of Surface Engineering, PG_00039740								
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	6		ECTS credits			1.0			
Learning profile	general academic profile		Assessment form			assessment			
Conducting unit	Zakład Technologii Biomateriałów -> Institute of Manufacturing and Materials Technology -> Faculty of Mechanical Engineering and Ship Technology						culty of		
Name and surname	Subject supervisor		dr inż. Beata Majkowska-Marzec						
of lecturer (lecturers)	Teachers		dr inż. Beata	Beata Majkowska-Marzec					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Projec	t	Seminar	SUM	
	Number of study hours	15.0	0.0	0.0	0.0		0.0	15	
	E-learning hours included: 0.0								
Learning activity and number of study hours	Learning activity Participation ir classes include plan		n didactic led in study	Participation in consultation hours		Self-study SUM		SUM	
	Number of study 15 hours			2.0		8.0 25			
Subject objectives	Acquainting with the structure of surface layers and coatings, as well as with the modification techniques of surface layers of metal materials. The characteristics, advantages and disadvantages of individual layers and coatings produced in a different way. Possibility of application to specific elements.								
Learning outcomes	Course outcome		Subject outcome		Method of verification				
	K6_W06		The student is able to select the surface modification method for a specific application.			[SW1] Assessment of factual knowledge			
	K6_K01		The student is aware of the need to improve his qualifications. Is able to cooperate with group members. He can inspire other people, knows when to turn to a person with more knowledge.			[SK5] Assessment of ability to solve problems that arise in practice [SK1] Assessment of group work skills			
	K6_W07		The student has knowledge of specific methods of modification of surface layers and the properties of the obtained layers.			[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects			
	K6_U06		The student is able to determine the type of connection of the coating with the substrate and determine its influence on the properties.			[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject			
Subject contents	The concept of the surface layer and the coating and the surface layer. The methods and techniques for producing surface layers. Strengthening techniques using the phenomenon of metal materials in the cold work processes. Chemical and electrolytic methods for preparation metal coatings. Theoretical basis of thermo-chemical treatment and technology diffusion saturation of steel with non-metals and metals. Spraying gas, arc, plasma and detonation. Glow discharge treatment techniques and their application. The processes of preparation of coatings from the vapor phase. Modification of the surface of biomaterials.								
Prerequisites and co-requisites	No requirements								

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade			
	written test	60.0%	100.0%			
Recommended reading	Basic literature	1. Burakowski T., Wierzchoń T.: Inżynieria powierzchni metali. WNT Warszawa 1995.				
		2. Praca zbiorowa pod redakcją Stanisława Tkaczyka.: Powłoki ochronne. Gliwice 1994.				
		3. Klimpel A.: Napawanie i natryskiwanie cieplne. Technologie. WNT Warszawa 2000.				
		4. Kula P.: Inżynieria warstwy wierzchniej. Wyd. Politechniki Łódzkiej, Łódź 2000.				
		5. Kusiński J.: Lasery i ich zastosowanie w inżynierii materiałowej. Kraków, Wyd. Naukowe Akapit 2000.				
	Supplementary literature	1. Wranglen G.: Podstawy korozji i ochrony metali. WNT Warszawa 1985.				
	eResources addresses	Adresy na platformie eNauczanie:				
Example issues/	1. Methods of surface engineering used to increase corrosion resistance.					
example questions/ tasks being completed	2. Surface engineering methods used to enhance the tribological wear resistance.					
Work placement	Not applicable					