GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Surface treatment technology, PG_00039924		
Field of study	Mechanical Engineering, Mechanical Engineering		
Date of commencement of studies	October 2020	Academic year of realisation of subject	2022/2023
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	3.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Zakład Technologii Biomateriałów -> Institute of Manufacturing and Materials Technology -> Faculty of Mechanical Engineering and Ship Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Beata Majkowska-Marzec	
	Teachers	dr inż. Beata Majkowska-Marzec	

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

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	7.0	23.0	75

Subject objectives

Student learns about technologies connected with manufacturing of surface layers and coatings

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U09] is able to plan the manufacturing, assembly and quality control processes of typical constructions and mechanical devices, estimating their costs	The student assesses the microstructure and properties of immersion and spray coatings. It examines surface layers produced by thermo-chemical treatment. Explains the technologies of obtaining advanced surface layers.	[SU4] Assessment of ability to use methods and tools
[K6_W03] possesses and is able to practically apply the knowledge on the construction, properties and testing methods of construction materials	The student classifies the techniques of producing surface layers. Describes the methods of chemical and electrolytic production of metallic coatings.	[SW1] Assessment of factual knowledge

Subject contents

Classification of manufacturing methods of surface layers. Chemical and electrolytic manufacturing methods of metallic coatings (i.a.). The chosen termo-chemical tratments (nitriding, carburizing, boronizing, aluminizing, titanation, for instance). Other methods, like: plasma spraying, detonation spraying, arc spraying, gas spraying. Additionally, surface technologies consisting in laser treatments, CVD and PVD, etc. Lab exercises: Identification and evaluation of various surface layers and coatings obtained by using different technologies.

Prerequisites and co-requisites

Knowledge of Materials Science I and II

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
exam	50.0%	60.0%
lab	50.0%	40.0%

Recommended reading

Basic literature	Kamaraj M.: Basics of Surface Technology, New Academic Science, 2018.

	Supplementary literature	Additional literature: Bach F., Laarmann A., Wenz T.: Modern Surface Technology 1st Edition, Wiley-VCH; 1st edition, 2006
	eResources addresses	Adresy na platformie eNauczanie: Technologia obróbki powierzchniowej, MiBM, TMiMK, Ist., sem.6 - Moodle ID: 30302 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=30302
Example issues/ example questions/ tasks being completed	1. Basic concepts of Surface Engineering: surface layer, a protective coating 2. Distribution of coatings and requirements imposed on them - because of the type of material from which itis produced, according to destination, due to the type of protection 3. Methods for producing surface layers: surface preparation, methods of mechanical, thermal-mechanical, thermal, thermo- chemical, electrochemical and chemical, physical.	
Work placement	Not applicable	