GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Biologically induced corrosion, PG_00039748		
Field of study	Materials Engineering, Materials Engineering, Materials Engineering		
Date of commencement of studies	October 2022	Academic year of realisation of subject	2025/2026
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	4	Language of instruction	Polish
Semester of study	7	ECTS credits	1.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Chemistry Technology and Biotechnology of Food -> Faculty of Chemistry -> Wydziały Politechniki Gdańskiej		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Paweł Filipkowski	
	Teachers		

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	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 in didactic classes included in study plan	Participation in consultation hours	Self-study	SUM
Number of study hours	15	1.0	9.0	25

Subject objectives

The aim of the lecture is familiarizing of students with machanisms of corrosion inducing by microorganisms.

Learning outcomes

Course outcome	Subject outcome	Method of verification
K6_K01	The student knows that he "knows nothing"	[SK1] Assessment of group work skills [SK4] Assessment of communication skills, including language correctness [SK5] Assessment of ability to solve problems that arise in practice
K6_U06	The student, for example, is able to predict potential problems in given conditions	[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools [SU5] Assessment of ability to present the results of task
K6_W07	The student knows the advantages and disadvantages of the materials used	[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge [SW2] Assessment of knowledge contained in presentation

Subject contents	General characteristic of microrganisms occurring in natural environment, particularly the microrganisms in the soil and water. Nutrition requirements and growth. Effect of environmental factors on microrganisms temperature, pH, oxidation-reduction potential, water activity, hydrostatic pressure. Microrganisms and environment: ecosystems, kinds of interactions among microorganisms. Corrosion induced by microorganisms: - prokaryotic: sulphate reducing bacteria; sulphur oxidizing bacteria and bacteria oxidizing reduced sulphate compounds; iron bacteria; biofilms producing bacteria, - eukaryotic: fungi, algae. Ways of corrosion inducing by microrganisms; modification of the enmviroment on the metal/solution interface by products of microbial metabolism, biofilm formation. Characteristics of biofilm and biofouling. Microbial inhibition of corrosion: mechanisms (neutralization effects of corrosive substances, forming protective films on a metal surface, decreasing the medium corrosiveness. General characteristic of the methods of detection, identification and monitoring of biocorrosion: control and analysis of biocorrosion, monitoring on line, chemical and physical analysis of water, chemical analysis of biofouling, detection and quantification of microorganisms. Prevention of biocorrosion: mechanical and chemical cleaning, biocides, corrosion inhibitors.
Prerequisites and co-requisites	General biological knowledge. Knowledge from the courses of Basis of Corrosion and Corrosion Protection Technologies

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. Videla H. A. Manual of Biocorrosion. Lewis Publishers, 1996. 2. Borenstein S. Microbiologically Influenced Corrosion Handbook, Woodhead Publishing Ltd., London, 1994. 2. UhligS corrosion handbook und. RV Revie. Willey 3rd, 2011
Supplementary literature	1. Schlegel H. S. Mikrobiologia ogólna. PWN, Warszawa, 2000, (Selected problems)
eResources addresses	
Example issues/ example questions/ tasks being completed	
Work placement	Not applicable

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