GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	BIO-CORROSION, PG_00064356		
Field of study	Corrosion		
Date of commencement of studies	February 2025	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	1	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		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Paweł Filipkowski	
	Teachers	dr inż. Paweł Filipkowski	

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
[K7_W01] defines the phenomena and processes used to produce consumer goods and run services	defines phenomena and processes used to produce e.g. fermentation tanks and provide services	[SW1] Assessment of factual knowledge
[K7_K02] understands the non-technical aspects and implications of graduate activity, including the impact on the environment	understands non-technical aspects and effects of graduates' activities, including the impact on the environment	[SK4] Assessment of communication skills, including language correctness
[K7_U02] conducts experiments using properly selected techniques and apparatus, taking advantage of new developments in corrosion and related fields	conducts experiments using properly selected techniques and equipment, taking advantage of new developments in corrosion and related fields	[SU2] Assessment of ability to analyse information

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 every lecture	60.0%	80.0%
Presentation/Essay	60.0%	20.0%

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	Adresy na platformie eNauczanie: BIOKOROZJA - Moodle ID: 44923 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=44923
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	

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