



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 2021	Academic year of realisation of subject				2024/2025	
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						
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 mechanisms of corrosion inducing by microorganisms.						
Learning outcomes	Course outcome		Subject outcome			Method of verification	
	K6_U06		Is able to integrate the information obtained on microorganisms causing biocorrosion and draw conclusions, formulate and justify opinions based on, for example, microscopic observations of surfaces or cells			[SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment	
	K6_K01		understands the need to improve professional and personal competences; is aware of his/her own limitations and knows when to turn to experts, is able to define priorities appropriately, e.g. to combat biocorrosion phenomena			[SK4] Assessment of communication skills, including language correctness [SK3] Assessment of ability to organize work	
	K6_W07		has detailed knowledge related to selected issues related to materials subject to biocorrosion			[SW2] Assessment of knowledge contained in presentation [SW1] Assessment of factual knowledge	
Subject contents	General characteristic of microorganisms occurring in natural environment, particularly the microorganisms in the soil and water. Nutrition requirements and growth. Effect of environmental factors on microorganisms temperature, pH, oxidation-reduction potential, water activity, hydrostatic pressure. Microorganisms 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 microorganisms; modification of the environment 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%
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. Uhlig'S 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:	
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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