



Subject card

Subject name and code	Biologically induced corrosion, PG_00035469						
Field of study	Corrosion						
Date of commencement of studies	February 2023	Academic year of realisation of subject			2023/2024		
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	2	ECTS credits			1.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Chemistry, Technology and Biochemistry 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		0.0		10.0	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		
	K7_U04		recognizes and can characterize particular corrosive phenomena, analyzes various forms of degradation and can determine the influence of various external and internal factors on its degree		[SU2] Assessment of ability to analyse information		
	K7_W02		has specialistic knowledge in the field of corrosion and degradation of materials, knows specific forms of corrosive interactions, their mechanism and methods of prevention		[SW3] Assessment of knowledge contained in written work and projects		
Subject contents	<p>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.</p>						
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. 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	
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	