



Subject card

Subject name and code	Design of corrosion protection systems, PG_00060765								
Field of study	Chemical Technology								
Date of commencement of studies	October 2025	Academic year of realisation of subject		2028/2029					
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		4.0					
Learning profile	general academic profile	Assessment form		assessment					
Conducting unit	Department of Corrosion and Electrochemistry -> Faculty of Chemistry -> Faculties of Gdańsk University of Technology								
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Stefan Krakowiak							
Lesson types	Teachers								
	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar			
	Number of study hours	15.0	0.0	0.0	45.0	0.0			
E-learning hours included: 0.0									
eNauczanie source address: https://enauczanie.pg.edu.pl/2025/course/view.php?id=2932									
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	60	10.0		50.0	120			
Subject objectives	The aim of the course is to present students with the problems related to the design of anti-corrosion protection for industrial and municipal facilities in terms of their longevity and to indicate the elements that should be taken into account when preparing an optimal design.								
Learning outcomes	Course outcome		Subject outcome		Method of verification				
	[K6_U08] Is able to select elements of automatic control systems for simple technological processes and use computer programs to control and optimize chemical processes.		The student is able to diagnose corrosion processes of structural materials based on information obtained from corrosion monitoring systems and measurements of physicochemical parameters from the installation.		[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject				
	[K6_W07] Has knowledge of raw materials and technologies in the chemical and polymer industries, also covering issues of corrosion and material protection.		The student has knowledge of the acquisition and production of raw materials for the chemical industry, taking into account the impact of processes on the degradation of machines and devices.		[SW3] Assessment of knowledge contained in written work and projects				
	[K6_U04] Is able to recognize and apply polymer processing methods, analyze corrosion processes of construction materials in the design of installations, taking into account systemic and non-technical aspects.		The student is prepared to carry out a project to protect an installation/part of an installation against corrosion, taking into account economics and environmental protection.		[SU3] Assessment of ability to use knowledge gained from the subject				
	[K6_K04] Understands the non-technical aspects of the work of a chemical engineer, including the impact on the environment, and is aware of professionalism, professional ethics and respect for diversity.		The student is aware of the impact of corrosion on changes occurring in the natural environment.		[SK5] Assessment of ability to solve problems that arise in practice				

Subject contents	<p>Course content – lecture Paint Coatings; Coating Systems; Surface Preparation Methods; The Role of Inspection in Design; Industrial Alloys; Factors Affecting Environmental Corrosion; Design Components; Components of Expertise; Pre-Design Studies.</p> <p>Course content – project PROJECT I - Based on environmental hazards, the selection of a coating system that will effectively protect the structure exposed in this defined environment. Based on the manufacturer's information contained in the technical data sheet, the presentation of surface preparation technology, painting method, intervals between subsequent coatings, and inspection procedures at each stage of coating system development.</p> <p>PROJECT II - The student receives a chemical and physicochemical description of the process medium. Based on this, the student selects a construction material an alloy that will exhibit corrosion rates below acceptable levels in this environment.</p>		
Prerequisites and co-requisites	Basic knowledge of basics of corrosion processes and polymer chemistry.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Passing Project 1	60.0%	70.0%
	Passing Project 2	60.0%	30.0%
Recommended reading	Basic literature	R. Juchniewicz, Anticorrosion Technology, Vol. 1 and Vol. 2; Branko N. Popov, Corrosion Engineering, Principles and solved problems V. R. Pludek, Design and Corrosion Control, 1977	
	Supplementary literature	Catalogs of companies producing paint and composite coatings;	
	eResources addresses	Catalogs of companies producing industrial alloys;	
Example issues/example questions/tasks being completed	Design for corrosion protection of the supporting structure of a pipeline trestle bridge for the transshipment of petroleum products at a seaport on the Baltic Sea. Selection of the construction material for a sulfuric acid tank (concentrations varying from 45 to 76%) containing chloride ions (2000 ppm).		
Practical activites within the subject	Not applicable		

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