



Subject card

Subject name and code	Design of corrosion protection systems, PG_00060765						
Field of study	Chemical Technology						
Date of commencement of studies	October 2024		Academic year of realisation of subject		2027/2028		
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				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	45.0	0.0	60
	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 classify and apply knowledge of the driving forces of corrosion processes in different construction materials to the design of process installations and the selection of corrosion protection methods for installations		The student is able to diagnose corrosion processes in structural materials, identify factors influencing their development, and select methods to mitigate the impact of corrosion on industrial structures.		[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject		
	[K6_W07] has knowledge of structural materials used in the chemical industry and their corrosion, corrosion monitoring and protection, and corrosion metrology		Student has knowledge of the relationships between the properties of structural materials and their applications in various branches of industry.		[SW1] Assessment of factual knowledge		
	[K6_K04] is able to think and act in an entrepreneurial way		The student is aware of the importance of economic aspects in the process of structural design and of the responsibility for the consequences of engineering decisions.		[SK5] Assessment of ability to solve problems that arise in practice		
	[K6_U03] is able to apply knowledge of inorganic, organic, physical and analytical chemistry and identify appropriate sources of information to design and synthesize simple chemical compounds, carry out basic physicochemical and analytical measurements		The student is able to define the corrosion risk of a structure based on the qualitative and quantitative analysis of environmental components.		[SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools		

Subject contents	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. 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. 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.		
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; Catalogs of companies producing industrial alloys;	
	eResources addresses		
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 activities within the subject	Not applicable		

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