



Subject card

Subject name and code	CORROSION PROTECTION FOR OFFSHORE WIND FARMS, PG_00064332						
Field of study	Chemical Technology						
Date of commencement of studies	February 2027		Academic year of realisation of subject		2026/2027		
Education level	second-cycle studies		Subject group		Optional subject group Specialty subject group Subject group related to scientific research in the field of study		
Mode of study	Full-time studies		Mode of delivery		blended-learning		
Year of study	1		Language of instruction		Polish		
Semester of study	1		ECTS credits		3.0		
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. Krzysztof Żakowski				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	15.0	0.0	45
	E-learning hours included: 15.0						
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	45		3.0		27.0	75
Subject objectives	To familiarize students with the problems of corrosion and technologies of corrosion protection of objects used in RES power generation on the example of offshore wind farms.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_W02] selects appropriate apparatus and materials for the manufacture and processing of consumer goods		The student knows the methods of corrosion protection of marine structures		[SW1] Assessment of factual knowledge		
	[K7_K01] critically evaluates the content of cognitive and practical problems		The student is able to appropriately determine priorities for the implementation of specific tasks		[SK5] Assessment of ability to solve problems that arise in practice		
	[K7_U03] designs innovative technological solutions for obtaining useful goods based on the state of the knowledge in accordance with the latest scientific literature		The student is able to use available software to design a cathodic protection system for a non-complex marine facility		[SU4] Assessment of ability to use methods and tools		

Subject contents	Course content – lecture <ul style="list-style-type: none">• Mechanisms of corrosion processes in the marine environment. Corrosion cells.• Technologies of corrosion protection by means of protective coatings and cathodic protection.• Electrochemical fundamentals of cathodic protection.• Technology of cathodic protection of underwater part of wind towers realized with galvanic anodes and with impressed current.• Potential criteria of cathodic protection.• Methods for evaluating the effectiveness of cathodic protection.• Principles of design of cathodic protection systems.• General principles of coating protection of marine structures.• Selection of coating system for environmental conditions.• Principles of surface preparation and paint coating application.• Inspection techniques of protective coatings.• Designing the cathodic protection system of an offshore wind power plant. <p>A computer program for modeling cathodic protection systems BEASY Cathodic Protection and BEASY GID will be used to design the protective installation by the students. The program allows selection of the number of anodes, design of their optimal distribution on the protected structure, visualization of the potential distribution on the protected surface and the obtained effect of cathodic polarization.</p>		
Prerequisites and co-requisites	Basic knowledge of electrical engineering and physical chemistry		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	laboratory - reports	100.0%	40.0%
	project	100.0%	20.0%
	lecture - test	60.0%	40.0%
Recommended reading	Basic literature	H.Uhlig, R.W.Revie, Corrosion and Corrosion Control, An Introduction to Corrosion Science and Engineering, John Wiley & Sons, 1985	
		F.Rezaei, P.Contestabile, et al.: Towards understanding environmental and cumulative impacts of floating wind farms: Lessons learned from the fixed-bottom offshore wind farms. OCEAN & COASTAL MANAGEMENT, Vol. 243, No. 106772, 2023, DOI: 10.1016/j.ocecoaman.2023.106772	
	Supplementary literature	Recommended practice DNVGL-RP-B401-2017: Cathodic protection design.	
	eResources addresses		
Example issues/ example questions/ tasks being completed	Methods of application of paint coatings.Measurement of coating thickness.Testing of coating adhesion.Galvanic anodes used for protection of marine structures.Potential criteria of cathodic protection.Determination of cathodic protection efficiency of exposed samples.Designing a simple cathodic protection system using galvanic anodes.		
Practical activities within the subject	Not applicable		

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