GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	CORROSION OF CERAMIC MATERIALS, PG_00064355		
Field of study	Corrosion		
Date of commencement of studies	February 2026	Academic year of realisation of subject	2025/2026
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	e-learning
Year of study	1	Language of instruction	Polish
Semester of study	1	ECTS credits	1.0
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. Andrzej Miszczyk	
	Teachers	dr hab. inż. Andrzej Miszczyk	

Lesson types

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: 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	15	1.0	9.0	25

Subject objectives

The aim of the course is to acquire the ability to recognize and describe the manifestations of corrosion of ceramic materials, understand its mechanisms, learn about research methods and methods of protection or minimize its effects.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_W01] defines the phenomena and processes used to produce consumer goods and run services	The student has the knowledge necessary to describe the phenomena and processes used in the production of consumer goods and the provision of services.	[SW3] Assessment of knowledge contained in written work and projects
[K7_U02] conducts experiments using properly selected techniques and apparatus, taking advantage of new developments in corrosion and related fields	The student is able to correctly select techniques and equipment for carrying out research, taking into account current achievements in corrosion and related fields.	[SU4] Assessment of ability to use methods and tools
[K7_K02] understands the non-technical aspects and implications of graduate activity, including the impact on the environment	The student is sensitive to non-technical aspects of his/her activities, including, in particular, the impact on the environment.	[SK5] Assessment of ability to solve problems that arise in practice

Subject contents

Course content – lecture
Properties of ceramics and metals. Basics of degradation of ceramic materials. Diffusion processes in solid bodies. Diffusion processes in oxides. The mechanism of oxidation in thin layers. Thick-layer oxidation. Wagner's theory of oxidation. Oxidation of pure metals. Oxidation of alloys. Oxidation in mixed environments. Corrosion in marine conditions. Coatings resistant to high temperatures. Corrosion problems of ceramic materials in industry and museology. Methods of protection and maintenance of ceramic materials.

Prerequisites and co-requisites

Knowledge of the fundamentals of corrosion. Knowledge of the basics of physical chemistry. in particular, atomic and molecular structures, bonds. Basic knowledge of physics and chemistry

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
test	60.0%	100.0%

Recommended reading	Basic literature	Ronald A. McCauley, Corrosion of Ceramic Materials, 2016 Jonathan Salem, Edwin Fuller, Corrosion, Wear, Fatigue, and Reliability of Ceramics, 2009 K.G. Nickel , Corrosion of Advanced Ceramics: Measurement and Modelling, 2012
	Supplementary literature	scientific journal papers
	eResources addresses	
Example issues/ example questions/ tasks being completed	The phenomenon of diffusion in the solid state. Kinetics of layer build up under specific conditions, scale in the presence of oxygen and / or sulfur compounds. Wagner theory. Degradation of ceramic materials. Raid layers. Methods for corrosion tests of ceramic materials. Methods of protection in corrosion of ceramic materials. Examples of corrosion of ceramic materials in industry.	
Practical activites within the subject	Not applicable	

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