GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	HIGH-TEMPERATURE CORROSION, PG_00064354		
Field of study	Corrosion		
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 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		

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 high-temperature corrosion, to understand its mechanisms, to learn about research methods and methods of protection or minimizing 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 that are used in the production of goods and the provision of services.	[SW1] Assessment of factual knowledge
[K7_U02] conducts experiments using properly selected techniques and apparatus, taking advantage of new developments in corrosion and related fields	The student correctly selects techniques and apparatus to investigate a specific problem and uses current advances in corrosion and similar 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 takes into account non-technical aspects in his/her professional activity, especially the impact on the environment.	[SK5] Assessment of ability to solve problems that arise in practice

Subject contents

Course content – lecture

Electrical properties of metals and their compounds. Basics of high temperature oxidation. 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. "Hot" corrosion. Negative scale descaling. Coatings resistant to high temperatures. High temperature corrosion problems in industry. Books on high-temperature corrosion.

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 the basics of quantum mechanics and the basics of chemistry

Assessment methods and criteria

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

Recommended reading	Basic literature	S. Mrowec, T. Weber, Korozja gazowa metali, Wydawnictwo "Śląsk", Katowice 1975, High Temperature Corrosion, vol. 1 and 2, Elsevier ed. A.S. Khanna, Introduction to high temperature oxidation and corrosion, ASM International, 2002, High Temperature Oxidation and Corrosion of Metals by David John Young, Elsevier 2008.
	Supplementary literature	there are no requirements
	eResources addresses	
Example issues/ example questions/ tasks being completed	Diffusion phenomena in solid state. Kinetics of growing scale layers on metals and alloys. Scale in the presence of oxygen and / or sulfur compounds. Wagner theory. Raid layers. High temperature corrosion test methods. High-melting metals. Protection methods in high-temperature corrosion. Examples of high-temperature corrosion in industry.	
Practical activites within the subject	Not applicable	

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