



Subject card

Subject name and code	High Temperature Corrosion, PG_00039703						
Field of study	Materials Engineering, Materials Engineering, Materials Engineering						
Date of commencement of studies	February 2022	Academic year of realisation of subject			2022/2023		
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			at the university		
Year of study	1	Language of instruction			Polish		
Semester of study	2	ECTS credits			2.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Electrochemistry, Corrosion and Materials Engineering -> Faculty of Chemistry						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Andrzej Miszczyk				
	Teachers						
Lesson types and methods of instruction	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: 0.0						
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		10.0		25.0	50
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_W06		He has knowledge in the field of materials science.		[SW3] Assessment of knowledge contained in written work and projects [SW2] Assessment of knowledge contained in presentation [SW1] Assessment of factual knowledge		
	K7_U01		He can determine the suitability of scientific methods and apparatus to obtain specific information in the field of materials engineering.		[SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information		
	K7_K01		He has knowledge in the field of materials engineering and related fields. He can present in a comprehensible way scientific achievements in the field of materials engineering.		[SK2] Assessment of progress of work [SK5] Assessment of ability to solve problems that arise in practice [SK3] Assessment of ability to organize work		
	K7_W04		The ability to present knowledge and the effects of own work. Good communication. Having self-assessment skills and constructive criticism.		[SW3] Assessment of knowledge contained in written work and projects [SW2] Assessment of knowledge contained in presentation [SW1] Assessment of factual knowledge		
Subject contents	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.		
Work placement	Not applicable		