



## Subject card

Subject name and code	Degradation and Protection of Building Materials , PG_00052986						
Field of study	Chemistry in Construction Engineering						
Date of commencement of studies	February 2023	Academic year of realisation of subject			2022/2023		
Education level	second-cycle studies	Subject group			Obligatory subject group 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	1	ECTS credits			3.0		
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	15.0	0.0	0.0	30
	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	30		9.0		36.0	75
Subject objectives	Understanding the causes and mechanisms of degradation of materials and methods of their protection and maintenance.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	K7_U04	The student can prepare and present a work of a character: research, design, application, theoretical analysis practical issues or monographic and can use scientific bases data and commercial calculation programs	[SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject
	K7_W06	A student recognizes typical signs of degradation of construction materials in different environments, also industrial. Student characterizes threats characteristic for degradation building materials. Student identifies mechanisms of degradation and methods of protection, and maintenance. Student makes selection of appropriate techniques and measuring devices for evaluation material resistance.	[SW1] Assessment of factual knowledge
	K7_W08	A student knows the mechanisms of degradation of materials; he has knowledge regarding methods of improvement of resistance to corrosion, erosion and other degradation mechanisms	[SW1] Assessment of factual knowledge
	K7_U09	A student has a well-established and theoretically founded knowledge within the scope of application of advanced methods for testing of structure and properties of materials; use of specialized equipment for scientific research and evaluation of effectiveness of processes and impact of working conditions	[SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information
	K7_K01	A student is aware responsibility for reliability of obtained results of their work and their interpretation	[SK1] Assessment of group work skills [SK5] Assessment of ability to solve problems that arise in practice [SK4] Assessment of communication skills, including language correctness
Subject contents	Degradation mechanisms of concrete, reinforced concrete, bricks, mortars, natural stones. Electrochemical corrosion of steel. Microbiological corrosion. Measurement methods in the evaluation of degradation. Methods of protection and maintenance. Protective coatings and electrochemical methods of protection. Standards for concrete protection. Examples of degradation of building objects. Conservation requirements for the repair of historical buildings.		
Prerequisites and co-requisites	Basics of electrochemistry and corrosion		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	test	60.0%	60.0%
	Laboratory exercises	100.0%	40.0%

Recommended reading	Basic literature	P. Perkins, Repair, Protection and Waterproofing of Concrete - 2002 G.C. Mays, Durability of Concrete Structures, Investigation, Repair, Protection - 2003 M.G. Alexander, Concrete Repair, Rehabilitation and Retroffing - 2012
	Supplementary literature	it is not required
	eResources addresses	Adresy na platformie eNauczenie:
Example issues/ example questions/ tasks being completed	Mechanism of degradation of steel reinforcement in concrete. The role of chlorides in the degradation of reinforced concrete. Process of carbonation; microbiological degradation; mortar protection methods; hydrophobizing - methods of application.	
Work placement	Not applicable	