

COURSE DESCRIPTION CARD

Faculty of Civil Engineering and Environmental Sciences										
Field of study								Degree level and programme type		
Specialization/ diploma path								Study profile	Academic profile	
Course name	Protection of building objects against moisture and corrosion							Course code	IS-FCEE-00178W	
								Course type	Erasmus	
Forms and number of hours of tuition	L	C	LC	P	SW	FW	S	Semester	winter	
	30		30					No. of ECTS credits	4	
Entry requirements	-									
Course objectives	Developing the ability to understand corrosion processes and to identify environmental and material corrosive hazards in building objects. Strengthening and expanding knowledge about effective methods of protecting buildings against moisture and corrosion. Developing competences in the field of laboratory and in-situ tests in the field of corrosion diagnostics and assessment of the moisture content of building objects.									
Course content	<p><u>Lecture:</u> Chemical and electrochemical corrosion of metals. Principles of passive and active electrochemical protection. Metal protection with inorganic coatings. Rules for protecting steel structures with paint coatings. Corrosion processes in cement materials. Principles of protection, repair and protection of reinforced concrete structures against moisture and degradation caused by corrosive processes of concrete. Causes and effects of building moisture, primary and secondary waterproofing, and drying methods. Biological corrosion of inorganic materials. Biological corrosion of wood - types of threats and principles of protection.</p> <p><u>Laboratory Classes:</u> Experimental study of the phenomena of electrochemical corrosion of metals: corrosion mechanism in a drop of water, corrosive cells, the impact of the type of environment on the rate of metal corrosion, protection with metal coatings (more and less noble than protected metal), active protection. Experimental study of the phenomena of chemical corrosion of cement materials: concrete pH assessment, carbonation depth assessment, corrosion rate testing in various environments. Wall salinity assessment. Moisture assessment of a building partition. Crack depth assessment in a building partition. Assessment of moisture capillary transport coefficients in building materials.</p>									
Teaching methods	Lecture: informative lecture, problem lecture, case study Laboratory Class: laboratory exercises, demonstration with explanation									

Assessment method	Lecture - semester assignment involving the analysis of corrosive causes and phenomena and a proposal of methods for repair and protection of the selected object (written study and multimedia presentation) Laboratory Class - performance of research tasks (in a team) and preparation of reports (in a team), written test		
Symbol of learning outcome	Learning outcomes	Reference to the learning outcomes for the field of study	
L01	knows and understands the corrosion processes occurring in materials and elements of building objects	K_B2_W01 K_B2_W11	
L02	knows the material and environmental causes of corrosion of building objects and is able to identify them	K_B2_W11	
L03	knows the methods of protection against moisture and corrosion of building objects and is able to assess their suitability for a particular application	K_B2_W05 K_B2_U11	
L04	carries out laboratory and in-situ tests in the field of corrosion diagnostics and assessment of the moisture content of building objects	K_B2_U08	
L05	prepares test reports, interprets test results and draws conclusions	K_B2_U10	
Symbol of learning outcome	Methods of assessing the learning outcomes	Type of tuition during which the outcome is assessed	
L01	semester assignment, written test	L, LC	
L02	semester assignment, written test	L, LC	
L03	semester assignment, written test	L, LC	
L04	verification of the correctness of the research task	LC	
L05	verification of the correctness of the report	LC	
Student workload (in hours)		No. of hours	
Calculation	participation in lectures	30	
	preparation of semester assignment (L)	20	
	participation in laboratory class	30	
	preparation of reports on research tasks (LC)	10	
	preparation for written tests (LC)	20	
	participation in consultations (L, LC)	2	
	TOTAL:	112	
Quantitative indicators		HOURS	No. of ECTS credits
Student workload – activities that require direct teacher participation		62	2.5
Student workload – practical activities		61	2.5
Basic references	Groysman A. Corrosion for everybody. Dordrecht : Springer, 2010. Knöfel D. Corrosion of building materials. New York : Van Nostrand Reinhold, 1978		

Supplementary references	Riggs O. L. Jr. Anodic protection : theory and practice in the prevention of corrosion. New York : Plenum Press, 1981.	
Organisational unit conducting the course	Department of Construction and Road Engineering	Date of issuing the programme
Author of the programme	Beata Backiel-Brzozowska, PhD. Eng.	26.02.2020

L – lecture, C – classes, LC – laboratory classes, P – project, SW – specialization workshop, FW - field work,

S – seminar