

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	Special concretes and recycling of concrete structures							Course code	IS-FCEE-00160W
								Course type	Erasmus
Forms and number of hours of tuition	L	C	LC	P	SW	FW	S	Semester	winter
	30		15	15				No. of ECTS credits	5
Entry requirements	Concrete technology								
Course objectives	The purpose of this module is to prepare students to: distinguish different applications of concrete and recognize respective requirements; select proper constituents, design mix composition and test selected performance features of concretes for special applications; recognize and select typical processes in recycled aggregate concrete production (including production of recycled aggregate).								
Course content	High Performance Concrete; Rheology of concrete; Self Compacting Concrete; Architectural Concrete; Underwater Concrete; Fiber Reinforced Concrete; Reactive Powder Concrete; Concrete for pavements (Roller Compacted Concrete vs. PCC pavements); Polymer Modified Cement Concrete; Lightweight concretes; Demolition and recycling of used concrete structures; Recycled aggregate; Recycled aggregate concrete.								
Teaching methods	A series of lectures to provide students with an overview of the main issues relating to the constituents, requirements, properties, technology of production, uses and long-term performance of concretes for special applications, an overview of methods and processes in recycling of used concrete structures; production, classification and properties of recycled aggregate and recycled aggregate concrete. A series of laboratory classes covering mix proportioning and the testing concrete properties in fresh and hardened state. Project of technology line for recycled aggregate production.								
Assessment method	Written exam								
Symbol of learning outcome	Learning outcomes							Reference to the learning outcomes for the field of study	
L01	Student (graduate) identifies requirements and production processes of special concretes.							K_W18 SD, K_U07	
L02	Student (graduate) qualitatively and quantitatively selects concrete constituent materials of selected special concretes							K_W18 SD, K_U07, K_U21 SD	

L03	Student (graduate) evaluates technical parameters of selected special concretes	K_W08, K_W15, K_U08
L04	Student (graduate) estimates composition and properties of old/used concrete	K_W18 SD, K_W19 SD, K_U21 SD
L05	Student (graduate) describes technical processes of recycled aggregate concrete (RAC) production	K_W18 SD, K_U21 SD, K_U22 SD
L06	Student (graduate) identifies machines and devices used for RAC production	K_W18 SD, K_U21 SD, K_U22 SD
L07	Student (graduate) uses Internet and other data bases	K_U23
L08	Student (graduate) works in team	K_K03
Symbol of learning outcome	Methods of assessing the learning outcomes	Type of tuition during which the outcome is assessed
L01	written test, completion of experimental tasks, evaluation of the student's reports	L, LC
L02	completion of experimental tasks, evaluation of the student's reports	LC
L03	completion of experimental tasks, evaluation of the student's reports	LC
L04	evaluation of the student's reports, completion of the student's project	P, LC
L05	written test, completion of the student's project	L, P
L06	written test, completion of the student's project	L, P
L07	written test, completion of the student's project, the laboratory student's reports	L, P, LC
L08	participation in practical classes - task completion in team	LC, P
Student workload (in hours)		No. of hours
Calculation	lecture attendance	30
	participation in laboratory classes, project	30
	preparation for laboratory classes and project	30
	work on reports and projects	30
	participation in student-teacher sessions related to the class	2
	preparation for and participation in exams/tests	30
	TOTAL:	152
Quantitative indicators		HOURS
Student workload – activities that require direct teacher participation		62
Student workload – practical activities		92
Basic references	1. P.-C. Aïtcin, High Performance Concrete, E&FN SPON, London 1998 2. Neville A.M., Properties of concrete, 5th edition, Pearson Education Ltd. 2011. 3. Neville A.M., Brooks J.J., Concrete Technology, 2nd edition, Trans-Atlantic Publications 2010. 4. Sika Concrete Handbook 2013 (pdf)	

	5. The European Guidelines for Self-Compacting Concrete. Specification, Production and Use, 2005, EFNARC, www.efnarc.org	
Supplementary references	1. Siddique R., Khan M.I., Supplementary Cementitious Materials, Springer 2011	
Organisational unit conducting the course	Department of Construction and Road Engineering	Date of issuing the programme
Author of the programme	Dorota Małaszkiwicz, PhD., CivEng Edyta Pawluczuk, PhD.,CivEng	05.03.2020

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

S – seminar