COURSE DESCRIPTION CARD

<table>
<tr><td colspan="11">Faculty of Civil Engineering and Environmental Sciences</td></tr>
<tr><td>Field of study</td><td colspan="7">Civil engineering</td><td>Degree level and programme type</td><td>Bachelor's degree</td></tr>
<tr><td>Specialization/ diploma path</td><td colspan="7"></td><td>Study profile</td><td>academic</td></tr>
<tr><td rowspan="2">Course name</td><td colspan="7" rowspan="2">Concrete technology</td><td>Course code</td><td>IS-FCEE 00020W</td></tr>
<tr><td>Course type</td><td></td></tr>
<tr><td rowspan="2">Forms and number of hours of tuition</td><td>L</td><td>C</td><td>LC</td><td>P</td><td>SW</td><td>FW</td><td>S</td><td>Semester</td><td>winter</td></tr>
<tr><td>15</td><td></td><td>30</td><td></td><td></td><td></td><td></td><td>No. of ECTS credits</td><td>4</td></tr>
<tr><td>Entry requirements</td><td colspan="9">Chemistry</td></tr>
<tr><td>Course objectives</td><td colspan="9">The purpose of this module is to: introduce classification, properties and testing of technical properties of concrete constituents, fresh and hardened concrete; teach how to select proper concrete constituents and design concrete composition; describe processes in concrete production.</td></tr>
<tr><td>Course content</td><td colspan="9">Aggregates for concrete and mortars. Mineral binders: cements, lime and gypsum. Mixing water for concrete. Additions and admixtures for concrete. Concrete according to the standard EN 206-1 "Concrete – Part 1: Specification, performance, production and conformity". Properties of fresh and hardened concrete and their testing. Concrete mix design calculations. Technological processes in concrete production.</td></tr>
<tr><td>Teaching methods</td><td colspan="9">A series of lectures to provide students with an overview of the main issues relating to the properties, uses and long-term performance of concrete. A series of laboratory classes covering the testing of concrete constituents, the manufacture and testing of fresh mortar as well as fresh and hardened concrete.</td></tr>
<tr><td>Assessment method</td><td colspan="9">Written exam</td></tr>
<tr><td>Symbol of learning outcome</td><td colspan="8">Learning outcomes</td><td>Reference to the learning outcomes for the field of study</td></tr>
<tr><td>LO1</td><td colspan="8">Student (graduate) applies legal regulations related to concrete</td><td>K_W15, K_W16, K_U20</td></tr>
<tr><td>LO2</td><td colspan="8">Student (graduate) identifies phenomena occurring during setting and hardening of concrete, mechanisms of admixtures and additions actions</td><td>K_W08</td></tr>
<tr><td>LO3</td><td colspan="8">Student (graduate) identifies processes and technological requirements in concrete productions</td><td>K_W08, K_W15, K_U07</td></tr>
<tr><td>LO4</td><td colspan="8">Student (graduate) qualitatively and quantitatively selects concrete constituents</td><td>K_W08, K_W19 SD, K_U07</td></tr>
<tr><td>LO5</td><td colspan="8">Student (graduate) evaluates technical parameters of</td><td>K_W08, K_U08</td></tr>
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	concrete in fresh and hardened state	
LO6	Student (graduate) uses Internet and other data bases	K_U23
LO7	Student (graduate) works in a team	K_K03
Symbol of learning outcome	**Methods of assessing the learning outcomes**	**Type of tuition during which the outcome is assessed**
LO1	written exam, completion of experimental task, evaluation of the student's reports	L, LC
LO2	written exam	L
LO3	written exam, completion of experimental task, evaluation of the student's reports	L, LC
LO4	written exam, completion of experimental task, evaluation of the student's reports	L, LC
LO5	completion of experimental task, evaluation of the student's reports	LC
LO6	written exam, completion of experimental task, evaluation of the student's reports and written evaluation	L, LC
LO7	completion of experimental task in a team	LC

Student workload (in hours)		No. of hours
Calculation	lecture attendance	15
	participation in laboratory classes	30
	preparation for laboratory classes	20
	work on reports	15
	participation in student-teacher sessions related to the class	2
	preparation for and participation in exams/tests	20
	TOTAL:	102

Quantitative indicators	HOURS	No. of ECTS credits
Student workload – activities that require direct teacher participation	49	1,9
Student workload – practical activities	65	2,5

Basic references	1. EN 206 Concrete – Part 1: Specification, performance, production and conformity. 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)	
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 Małaszkiewicz, PhD, CivEng	10.03.2021

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