COURSE DESCRIPTION CARD

<table>
<tr><td colspan="10">Faculty of Civil Engineering and Environmental Sciences</td></tr>
<tr><td>Field of study</td><td colspan="6"></td><td colspan="2">Degree level and programme type</td><td></td></tr>
<tr><td>Specialization/ diploma path</td><td colspan="6"></td><td colspan="2">Study profile</td><td>Academic profile</td></tr>
<tr><td rowspan="2">Course name</td><td colspan="6" rowspan="2">Concrete structures II</td><td colspan="2">Course code</td><td>IS-FCEE-00059S</td></tr>
<tr><td colspan="2">Course type</td><td>Erasmus</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>summer</td></tr>
<tr><td>30</td><td></td><td></td><td>30</td><td></td><td></td><td></td><td>No. of ECTS credits</td><td>6</td></tr>
<tr><td>Entry requirements</td><td colspan="9">Civil Engineering Materials, Concrete Technology, Strength of Materials, Structural (Building) Mechanics, Concrete Structures I</td></tr>
<tr><td>Course objectives</td><td colspan="9">Increased knowledge of the design and construction of reinforced and prestressed concrete structures. The skills necessary to analyze, design and construct of engineering reinforced concrete objects. The skills to identify the issues related to the design (calculation and detailing of reinforcement) and construction of reinforced and prestressed concrete structures.</td></tr>
<tr><td>Course content</td><td colspan="9">Structural analysis, basic requirements; Slabs: one-way spanning solid and ribbed slabs; two-way spanning slid slabs; waffle slabs; flat slabs; stair slabs. Yield line design; Finite element (FE) design. Columns: short braced axially loaded columns; short columns subjected to axial load and bending; effective height of column (braced and unbraced); slenderness limits for columns. Foundations and Retaining Wall. Framed Buildings and frame analysis. Industrial buildings. Buildings with flat slabs. Precast RC-elements, basis of design and detailing. Prestressed concrete. Basic statements. Post-tensioned and pretensioned structures Prestress losses. Anchorage and transmission zones. Design of section under ULS and SLS Detailing of structural members.</td></tr>
<tr><td>Teaching methods</td><td colspan="9">traditional lecture, tasks for self-solution, group discussion of solutions proposed</td></tr>
<tr><td>Assessment method</td><td colspan="9">lecture – written exam; project – project completion, presentation and discussion</td></tr>
<tr><td>Symbol of learning outcome</td><td colspan="7">Learning outcomes</td><td colspan="2">Reference to the learning outcomes for the field of study</td></tr>
<tr><td>LO1</td><td colspan="7">student knows the basic principles of limit states design</td><td colspan="2">KB2_W02, KB2_W11</td></tr>
<tr><td>LO2</td><td colspan="7">selects the materials and its characteristics for RC –and prestressed concrete members design</td><td colspan="2">KB2_W05, KB2_U12</td></tr>
<tr><td>LO3</td><td colspan="7">knows how to assess actions and action combinations</td><td colspan="2">KB2_U04</td></tr>
<tr><td>LO4</td><td colspan="7">analyses and designs of the reinforced and prestressed concrete structures</td><td colspan="2">KB2_W02, KB2_U04</td></tr>
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LO5	works out of the project documentation for flat slab building	KB2_U19
Symbol of learning outcome	**Methods of assessing the learning outcomes**	**Type of tuition during which the outcome is assessed**
LO1	written exam, project evaluation, project discussion	L, P
LO2	written exam, project evaluation	L, P
LO3	written exam, evaluation of calculations	L, P
LO4	project evaluation and discussion	P
LO5	evaluation of project documentation	P
Student workload (in hours)		**No. of hours**
Calculation	lecture attendance	30
	participation in classes, project, seminars, etc.	30
	preparation for classes, projects, seminars, etc.	5
	working on projects, reports, etc.	35
	participation in student-teacher sessions related to the classes/seminar/project	10
	implementation of project tasks preparation for and participation in exams/tests	30
	TOTAL:	**135**

Quantitative indicators	**HOURS**	**No. of ECTS credits**
Student workload – activities that require direct teacher participation	70	2,5
Student workload – practical activities	65	2,5

Basic references	1. Eurocode 2: Design of concrete structures - Part 1-1: General rules and rules for buildings, 2004; 2. Tur V., Kosior-Kazberuk M., etc., Concrete Structures, 2020, Bialystok, Publishing house of Bialystok University of Technology. - 539 pp	
Supplementary references	Designers guide to EN 1992-1-1and EN 1992-1-2 Eurocode2- ThomasTielford,2009- 242p.	
Organisational unit conducting the course	**Department of Building Structures**	**Date of issuing the programme**
Author of the programme	**prof. dr hab. inż. Viktar Tur**	**08.03.2021**

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