

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Concrete Structures</b>		Code <b>1010101151010110072</b>
Field of study <b>Civil Engineering First-cycle Studies</b>	Profile of study (general academic, practical) <b>general academic</b>	Year /Semester <b>3 / 5</b>
Elective path/specialty <b>-</b>	Subject offered in: <b>Polish</b>	Course (compulsory, elective) <b>obligatory</b>
Cycle of study: <b>First-cycle studies</b>	Form of study (full-time, part-time) <b>full-time</b>	
No. of hours Lecture: <b>30</b> Classes: <b>15</b> Laboratory: <b>-</b> Project/seminars: <b>15</b>		No. of credits <b>6</b>
Status of the course in the study program (Basic, major, other) <b>basic</b>		(university-wide, from another field) <b>university-wide</b>
Education areas and fields of science and art <b>technical sciences</b>		ECTS distribution (number and %) <b>6 100%</b>
<b>Responsible for subject / lecturer:</b> dr inż. Jacek Ścigałło email: jacek.scigallo@put.poznan.pl tel. +48 061 665 2465 Faculty of Civil and Environmental Engineering 60-785 Poznań, ul.Piotrowo 5		<b>Responsible for subject / lecturer:</b> dr inż Teresa Grabiec-Mizera email: teresa.grabiec-mizera@put.poznan.pl tel. + 48 061 665 2085 Faculty of Civil and Environmental Engineering 60-785 Poznań, ul.Piotrowo 5
<b>Prerequisites in terms of knowledge, skills and social competencies:</b>		
1	<b>Knowledge</b>	A student has the knowledge of general mechanics and strength of materials, basis of theory of reinforced concrete structures, knows analysis principles of simple and complex RC elements design. A student knows building standards and requirements concerning design of building structures and their elements.
2	<b>Skills</b>	A student can estimate and report permanent and variable loads acting on building structures. Student can classify building structures, design RC structure elements and choose analytical or numerical solution of engineering problems.
3	<b>Social competencies</b>	A student understands the need for lifelong learning and knows how to interact in a group.
<b>Assumptions and objectives of the course:</b> -The gaining of knowledge and skills concerning design of RC slab elements (working in different way) in ULS and SLS. Analysis of building structures. Preparing for modeling of RC structures by the Autodesk Robot Structural Analysis Program.		
<b>Study outcomes and reference to the educational results for a field of study</b>		
<b>Knowledge:</b>		
1. A student knows the basic design method of RC slab elements in RC structures - [K 2 W02, K 2 W04, K 2 W14] 2. A student presents the design issues of spatial RC structures - [K 2 W04, K 2 W09, K 2 W14 ] 3. A student knows the range applying of computers program needed to analyse and design RC structures. - [K 2 W08, K 2 W16 ]		
<b>Skills:</b>		
1. A student uses building standards of loads on building structures as well as in the static calculation and dimensioning of RC structures. - [K 2 W01, K 2 W02, K 2 W03, ] 2. A student is able to design RC slab structures with taken frames into consideration - [K 2 W03, K 2 W13]		
<b>Social competencies:</b>		
1. A student understands the need of lifelong learning, is able to organize the learning process of others. - [K 2 W02, K 2 W03] 2. A student is able to cooperate and work in a group - [K 2 W01, K 2 W06] 3. He correctly identifies and resolves problems associated with his profession - [K 2 W07]		
<b>Assessment methods of study outcomes</b>		

<p>-Credit of exercise classes          Credit in written form (1.0h)          Credit of projects          Estimation of individual projects on the basis of calculations and structural drawings with a defence of submitted work          Number of evaluation</p> <table border="0"> <tr> <td>[%]</td> <td>(grade)</td> </tr> <tr> <td>100- 91</td> <td>A excellent</td> </tr> <tr> <td>90- 75</td> <td>B very good</td> </tr> <tr> <td>74- 65</td> <td>C good</td> </tr> <tr> <td>64- 51</td> <td>D sufficient</td> </tr> <tr> <td>&lt; 50</td> <td>E failed</td> </tr> </table>			[%]	(grade)	100- 91	A excellent	90- 75	B very good	74- 65	C good	64- 51	D sufficient	< 50	E failed
[%]	(grade)													
100- 91	A excellent													
90- 75	B very good													
74- 65	C good													
64- 51	D sufficient													
< 50	E failed													
<b>Course description</b>														
<p>-Form of teaching: classes          Method of designing and dimensioning RC slab structures especially two-way reinforced slabs          Load report in two-way reinforced slabs          Dimensioning of reinforced concrete slab structures to bending and shear ULS, SLS.          Form of teaching: projects          Project of two-way reinforced slab</p>														
<b>Basic bibliography:</b>														
<ol style="list-style-type: none"> <li>PN-EN 1992-1-1 Eurokod 2. Projektowanie konstrukcji z betonu. Część 1-1: Reguły ogólne i reguły dla budynków.</li> <li>Ajdukiewicz A.: Eurokodu 2. Podręczny skrót dla projektantów konstrukcji żelbetowych.</li> <li>Starosolski W.: Konstrukcje żelbetowe według PN-B-03264:2002 i Eurokodu 2. PWN</li> <li>Knauff M.: Obliczanie konstrukcji żelbetowych według Eurokodu, PWN Warszawa 2012</li> <li>Knauff M., Golubińska A.: Tablice i wzory do projektowania konstrukcji żelbetowych z przykładami obliczeń, PWN Warszawa 2013</li> <li>Łapko A., Jansen B.C.: Podstawy projektowania i algorytmy obliczeń konstrukcji żelbetowych, Arkady, Warszawa 2005</li> <li>Rawska-Skotniczy A.: Obciążenia budynków i konstrukcji budowlanych według Eurokodów, PWN, Warszawa 2013.</li> </ol>														
<b>Additional bibliography:</b>														
<ol style="list-style-type: none"> <li>Sekcja Konstrukcji Betonowych KILiW PAN Podstawy projektowania konstrukcji żelbetowych i sprężonych według Eurokodu 2. Dolnośląskie Wydawnictwo Edukacyjne.</li> <li>Mosley B., Bungey J., Hulse R.: Reinforced concrete design to Eurocode 2, Palgrave Macmillan New York 2009.</li> </ol>														
<b>Result of average student's workload</b>														
<b>Activity</b>	<b>Time (working hours)</b>													
1. Participation in audience classes	30													
2. Participation in design classes	30													
3. Complete (at home) works involved in the project	30													
4. Participation in the consultations associated with the audience and design classes	30													
5. Preparing to the final test of classes content	30													
<b>Student's workload</b>														
<b>Source of workload</b>	<b>hours</b>	<b>ECTS</b>												
Total workload	150	6												
Contact hours	80	3												
Practical activities	70	3												