

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Concrete Structures		Code 1010115111010110072
Field of study Civil Engineering Extramural Second-cycle	Profile of study (general academic, practical) general academic	Year /Semester 1 / 1
Elective path/specialty Construction Engineering and Management	Subject offered in: Polish	Course (compulsory, elective) obligatory
Cycle of study: Second-cycle studies	Form of study (full-time, part-time) part-time	
No. of hours Lecture: 18 Classes: - Laboratory: - Project/seminars: 10		No. of credits 4
Status of the course in the study program (Basic, major, other) other		(university-wide, from another field) university-wide
Education areas and fields of science and art		ECTS distribution (number and %)
Responsible for subject / lecturer: dr inż. Piotr Frąszczak email: piotr.fraszczak@put.poznan.pl tel. +48 061 665 2057 Faculty of Civil and Environmental Engineering 60-785 Poznań, ul.Piotrowo 5		Responsible for subject / lecturer: dr inż. Piotr Frąszczak email: piotr.fraszczak@put.poznan.pl tel. + 48 061 665 2057 Faculty of Civil and Environmental Engineering 60-785 Poznań, ul.Piotrowo 5
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	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	Skills	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	Social competencies	A student understands the need for lifelong learning and knows how to interact in a group.
Assumptions and objectives of the course: -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.		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
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]		
Skills:		
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]		
Social competencies:		
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]		
Assessment methods of study outcomes		

<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>< 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													
Course description														
<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>														
<p>Basic bibliography:</p> <ol style="list-style-type: none"> 1. PN-EN 1992-1-1: wrzesień 2008 ? Eurokod 2. Projektowanie konstrukcji z betonu. Część 1-1: Reguły ogólne i reguły dla budynków. 2. PN-B-03264:2002 ? Konstrukcje betonowe żelbetowe i sprężone. Obliczenia statyczne i projektowanie. 3. Kobiak J. Stachurski W.: Konstrukcje żelbetowe, Arkady 4. Starosolski W.: Konstrukcje żelbetowe według PN-B-03264:2002 i Eurokodu 2. PWN 5. Knauff M.: Obliczanie konstrukcji żelbetowych według Eurokodu, PWN Warszawa 2012 6. Halicka A, Franczak D.: Projektowanie zbiorników żelbetowych. Tom 1: Zbiorniki na materiały sypkie. Tom 2 Zbiorniki na ciecze, PWN, 7. Ajdukiewicz A.: Eurokodu 2. Podręczny skrót dla projektantów konstrukcji żelbetowych. 8. Knauff M., Golubińska A.: Tablice i wzory do projektowania konstrukcji żelbetowych z przykładami obliczeń, PWN Warszawa 2013 														
<p>Additional bibliography:</p> <ol style="list-style-type: none"> 1. Łapko A., Jansen B.C.: Podstawy projektowania i algorytmy obliczeń konstrukcji żelbetowych, Arkady, Warszawa 2005 2. Knauff M., Golubińska A.: Tablice i wzory do projektowania konstrukcji żelbetowych z przykładami obliczeń, PWN Warszawa 2013 														
Result of average student's workload														
Activity		Time (working hours)												
1. Lectures		18												
2. Participation in design classes		10												
3. Complete (at home) works involved in the project		30												
4. Participation in the consultations associated with the audience and design classes		10												
5. Preparing to the final test		12												
Student's workload														
Source of workload	hours	ECTS												
Total workload	80	4												
Contact hours	28	1												
Practical activities	52	3												