STUDY MODULE DESCRIPTION FORM

Name of the module/subject		Code
Concrete Structures		**1010104171010110072**
Field of study	Profile of study (general academic, practical)	Year /Semester
Civil Engineering First-cycle Studies	**general academic**	**4 / 7**
Elective path/specialty	Subject offered in:	Course (compulsory, elective)
-	**Polish**	**elective**
Cycle of study:	Form of study (full-time,part-time)	
First-cycle studies	**part-time**	

No. of hours				No. of credits
Lecture: **22**	Classes: **10**	Laboratory: **-**	Project/seminars: **10**	**6**

Status of the course in the study program (Basic, major, other)	(university-wide, from another field)
major	**from field**

Education areas and fields of science and art	ECTS distribution (number and %)
technical sciences	**6 100%**
Technical sciences	**6 100%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Student has knowledge of: general mechanics and strength of materials, basis of theory of concrete structures, knows analysis principles of simple and complex RC elements design. Students knows building standards and requirements concern design of building structures and their elements.
2	**Skills**	Students can estimate and report permanent and variable load acting on the building structures. Students can classify building structures, design RC structure elements and choose analytical or numerical solution of engineering problems.
3	**Social competencies**	Understand the need for lifelong learning and knows how to interact In a group.

Assumptions and objectives of the course:

-The aim of the subject is to teach students how to according to obligatory standards calculate concrete and reinforced concrete simple and complex RC structures working in different ways.

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. A student has knowledge concerns loads of structures and their combinations - [K_W05]
2. A student can calculate internal forces to design concrete structures - [K_W05]
3. A student knows rules of calculation of RC sections in complex state of loading - [K_W03, K_W08]
4. A student knows rules of designing selected monolith RC structures - [K_W07]

Skills:

1. A student can set down loads of structures and find negative load combinations case. - [K_U05, K_U02]
2. A student can calculate frames, foundations, stairs, two-way slabs, slabs supported by beams, retaining walls - [K_U02, K_U05]
3. A student can design reinforcement of selected monolith RC elements and structures - [K_U01, K_U08]

Social competencies:

1. A student understand the need for lifelong learning; able to inspire and organize the learning process of others - [K1_K06]
2. A student able to interact and work in a group - [K1_K01]
3. A student correctly identifies and resolves dilemmas associated to his profession - [K1_K07]

Assessment methods of study outcomes

-Lectures ? test in written form ? 1,5h

Exercises classes ? test in written form (1,5h ? per semester)

Design classes - evaluation of individual student projects combined with an oral defense of the thesis, test in the exercises (1 per semester - 1.5 hours)

test in the lectures. (1 per semester - 1.5 hours)

The evaluation scale:

more than 100 excellent

91-100 very good (A)

81 - 90 good plus (B)

71 - 80 Good (C)

61 - 70 is sufficient plus (D)

51 - 60 satisfactory (E)

insufficient under 50 (F)

Course description

-One-way column-supported slab with beams

Two-way slabs

Concrete stairs

Footings and foundations. Mat foundations.

Retaining walls

Frames

Basic bibliography:

1. 1. PN-EN 1992-1-1 Eurokod 2. Projektowanie konstrukcji z betonu. Część 1-1: Reguły ogólne i reguły dla budynków.

2. 2. Knauff M.: Obliczanie konstrukcji żelbetowych według Eurokodu, PWN Warszawa 2012

3. 3. Knauff M., Golubińska A.: Tablice i wzory do projektowania konstrukcji

4. Starosolski W.: Konstrukcje żelbetowe według PN-B-03264:2002 i Eurokodu 2. PWN 2012

5. Grabiec K.: Konstrukcje betonowe. PWN 1996

6. . Kobiak J., Stachurski W.: Konstrukcje żelbetowe. Arkady 1990

Additional bibliography:

1. Sekcja Konstrukcji Betonowych KILiW PAN Podstawy projektowania konstrukcji żelbetowych i sprężonych według Eurokodu 2. Dolnośląskie Wydawnictwo Edukacyjne 2006

2. Mosley B., Bungey J., Hulse R.: Reinforced concrete design to Eurocode 2, Palgrave Macmillan New York 2009.

Result of average student's workload

Activity	Time (working hours)
1. Participation in lectures	22
2. Participation in exercise classes	10
3. Participation in design classes	10
4. Complete (at home) works involved in the project	30
5. Participation in the consultations of the exercise and design classes	10
6. Preparing to the test in the field of exercise and design classes	25
7. Preparing to the exams test	25

Student's workload

Source of workload	hours	ECTS
Total workload	150	6
Contact hours	47	2
Practical activities	45	2