BUILDING STRUCTURES 2

General information	
Subject	Building Structures 2
Faculty	Faculty of Civil Engineering, Architecture and Environmental Engineering
Course of study	Architecture
Profile	General academic
Type of study	I level with the degree of Eng. Arch.
Starting semester	Winter semester

Information about the subject	
Semester	5
Number of ECTS points	2
Subject type	obligatory
Language of instruction	English
Syllabus prepared by	Dr hab. inż. Jacek Korentz, prof. UZ

Type of class

Course type	*Number of classes per semester (full time studies)*	*Number of classes per week (full time studies)*	*Number of classes per semester (part time studies)*	*Number of classes per week (part time studies)*	*Credit type*
Lecture	15	1	-	-	Credit with a grade
Exercises	30	2	-	-	Credit with a grade

Subject objective

1. The objective in terms of knowledge is to familiarize the student with concrete as a building material, with the principles of interaction between concrete and reinforcing steel in load transfer, principles of operation of reinforced concrete sections and concrete structures.

2. The objective in terms of skills is to teach the student to design basic elements of concrete structures (beams, slabs, columns and foundations).

3. The objective in terms of personal and social competences is to prepare the student to present their own project with a solution to a concrete structure task in class and defend it in front of a group of students.

Initial requirements

Formal: General construction, Structural mechanics, Materials science

Subject scope

Lecture: The essence of reinforced concrete structures, interaction of concrete and reinforcing steel. Mechanical properties of concrete and reinforcing steel.
Ultimate limit states: bending sections, eccentrically compressed cross-sections, shear zone.
Serviceability limit states: limiting stresses, checking cracks, checking deflections.
Rules of designing reinforced concrete elements: beams, plates, columns, foundations. Principles of shaping reinforcement in reinforced concrete elements.
Construction of reinforced concrete structures: longwall structures, rod and frame constructions. Compressed constructions - overview.
Exercises: Design of reinforced concrete elements: monolithic slab, beam, column, foundation

footing.

Educational methods
Explanation methods: lectures - conventional. Research methods: exercises – individual work on a project based on the teacher's explanations

Education results and verification methods

Description	*Symbol*	*Verification method*	*Type of class*
The student has a coherent, theoretical general knowledge of key issues in terms of concrete structures. The student has a knowledge of the mechanical properties of concrete and steel, including checking the load capacity and dimensioning of reinforced concrete cross-sections and the principles of designing basic structural elements	K_W02	– test with points	Lecture
The student can use analytical methods to formulate and solve engineering tasks, while formulating and solving engineering tasks, the student can notice their system and non-technical aspects. The student can determine the bearing capacity of simple reinforced concrete structural elements	K_U07	– systematic inspection of project progress	Exercises
The student can cooperate and act in a team, assuming different roles in it. The student is aware of the responsibility for individual work and ready to comply with the rules of teamwork.	K_K02	– observation and evaluation of participation in the classes, – observation and evaluation of the student's practical skills	Lecture, exercises

Requirements to obtain a credit
Lectures: test with points: 50% - 60% of correct answers – satisfactory, 61% - 70% of correct answers – satisfactory plus, 71% - 80% of correct answers – good, 81% - 90% of correct answers – good plus, 91% - 100% of correct answers – very good.

Student's work

Student's work	*Full time study (h)*
Interaction with the teacher (classes; consultations; exam, etc.)	50
Student's individual work (preparation for the classes, test exam; literature research preparation of: written paper, project, presentation, report, speech; etc.)	10
Total	60
ECTS points	*Full time study*
Work with a teacher	0
Work without a teacher	2
Total	2

Basic literature

1. PN-EN 1992-1-1: Eurokod 2: Projektowanie konstrukcji z betonu. Część 1-1: Reguły ogólne i reguły dla budynków. 2008.

2. PN-B-03264: Konstrukcje betonowe, żelbetowe i sprężone. Obliczenia statyczne i projektowanie. 2002.

3. PN-88/B-01041: Rysunek konstrukcyjny budowlany. Konstrukcje betonowe, żelbetowe i sprężone.

4. Łapko A., Jansen B. C., Podstawy projektowania i algorytmy obliczeń konstrukcji żelbetowych. Arkady, Warszawa 2005.

5. Grabiec K., Bogucka J., Grabiec T., Obliczanie przekrojów w elementach betonowych i żelbetowych (wg. PN-B-03264:1999). Arkady, Warszawa 2004.

6. Starosolski W., Konstrukcje żelbetowe według Eurokodu 2 i norm związanych, T.1-4, Wydawnictwo Naukowe PWN, Warszawa 2012.

Complementary literature

Notes