



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Concrete Structures

### Course

Field of study

Civil Engineering First-cycle Studies

Area of study (specialization)

Civil Engineering

Level of study

First-cycle studies

Form of study

part-time

Year/Semester

IV/6

Profile of study

general academic

Course offered in

polish

Requirements

compulsory

### Number of hours

Lecture

18

Laboratory classes

18

Other (e.g. online)

Tutorials

10

Projects/seminars

### Number of credit points

4

### Lecturers

Responsible for the course/lecturer:

dr inż. Teresa Grabiec-Mizera

Responsible for the course/lecturer:

### Prerequisites

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.

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.

Social competencies: 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.

### Course objective

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.



### Course-related learning outcomes

#### 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 competences

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]

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

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 (5)

81 - 90 good plus (4,5)

71 - 80 Good (4)



61 - 70 is sufficient plus (3,5)

51 - 60 satisfactory (3)

insufficient under 50 (2)

### Programme content

One-way column - supported slab with beams

Two-way slabs

Concrete stairs

Footings and foundations. Mat foundations.

Retaining walls

Frames

### Teaching methods

Lecture - multimedia presentations, calculations and examples- conventional method (blackboard and chalk)

Classes and projects - multimedia presentations, calculations and examples- conventional method (blackboard and chalk), tutorial

### Bibliography

Basic

1. PN-EN 1992-1-1 Eurokod 2. Projektowanie konstrukcji z betonu. Część 1-1: Reguły ogólne i reguły dla budynków.
2. Knauff M.: Obliczanie konstrukcji żelbetowych według Eurokodu, PWN Warszawa 2018
3. Knauff M., Golubińska A.: Tablice i wzory do projektowania konstrukcji 2012
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

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.



### Breakdown of average student's workload

	Hours	ECTS
Total workload	100	4,0
Classes requiring direct contact with the teacher	46	2,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) <sup>1</sup>	54	2,0

<sup>1</sup> delete or add other activities as appropriate