1. Course number and name

RB-S1-19-S6F-D3, **Urban Structures Design**

2. Credits and contact hours*

4 ECTS, lectures: project: 30 hours**

3. Instructor's or course coordinator's name

Mariusz Jaśniok PhD, DSc/University Professor

4. Text book, title, author, and year

- O'Brien E.J., Dixon A.S.: Reinforced and Prestressed Concrete Design – The Complete Process, Longman Scientific & Technical,
- Woods W.R., Anders C.K.: Principles and Practices of Commercial Construction; Pearson.

a. other supplemental materials

- EN 1990:2002 Eurocode: Basis of Structural Design.
- EN 1991-1-1: 2001. Eurocode 1: Actions on structures. Part 1-1: General actions. Densities, self-weight, imposed loads for buildings.
- EN 1991-1-3:2003. Eurocode 1: General actions. Part 1-3. Snow loads.
- EN 1991-1-4:2004. Eurocode 1: Actions on structures. General actions. Part 1-4. Wind actions.

5. Specific course information

a. brief description of the content of the course (catalog description)

Project:

Design the multi-storey building with the flat slab constructions.

1. Preliminary analysis and design of building construction. Preliminary drawings of first floor plan and cross-section of the building in a 1:100 scale.

2. Detailed analysis and design of a flat slab construction using the Equivalent Frame Method

3. Detailed analysis and design of a flat slab construction using the Finite Element Method.

4. Comparison of the analysis results of a flat slab construction using EFM and FEM.

5. A reinforcement drawing of the flat slab in a 1:50 scale.

b. prerequisites or co-requisites

Knowledge of basics of concrete structures design.

c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program

Selected elective.

6. Specific goals for the course

a. specific outcomes of instruction, ex. The student will be able to explain the significance of current research about a particular topic

The student can:

- perform the combination of actions according to selected Eurocodes.
- define computational models of computer analysis of structures, simulate various construction variants, perform static analysis of statically determinate and indeterminate bar structures, as well as critically evaluate the results of these analyzes,
- size selected structural elements and design flat slab RC structure,
- prepare graphic documentation in the environment of selected CAD or BIM software
- critical evaluation of knowledge and recognition of the importance of knowledge in solving cognitive and practical problems, improving professional and personal competences, developing language skills

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

K1A_U02, K1A_U03, K1A_U04, K1A_U07, K1A_K03

7. Brief list of topics to be covered

Preliminary design of a multi-storey building, construction of a 2d and 3D model of a the flat-slab structure, specification of loads and load combinations according to Eurocodes, static calculations, design of reinforced concrete elements, structural drawings of the floor slab and multi-storey column reinforcement.

*- Consultations were not included in the contact hours

**-per semester