1. Course number and name

RB-S1-19-W28, **Selected Engineering Problems - Fundamentals of Structural Design**

2. Credits and contact hours*

2 ECTS, lectures: 10 hours**, classes: 2 hours**, project: 10 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

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)

Lectures:

(1) Basic information, (2) Actions on structures, (3) Permanent and variable actions, (4) Snow loads, (5) Wind action.

Classes:

Discussing three projects. Project No 1 – Permanent and variable actions, Project No 2 – Snow actions, Project No 3 – Wind actions.

Project:

There are three project to perform: Project No 1 – Permanent and variable actions according to PN-EN 1991 Part 1-1: Project No 2 – Snow actions according to PN-EN 1991 Part 1-3. Project No 3 – Wind actions according to PN-EN 1991 Part 1-4

b. prerequisites or co-requisites

No prerequisites and additional requirements

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

Required.

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:

- describe selected structural systems and basic mechanisms of load transfer,
- give classifications of building actions, enumerate ultimate and serviceability limit states and combination of actions according to Eurocodes,
- prepare a load statement for various types of structures and actions,
- perform the combination of actions according to selected Eurocodes.

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

K1A_U01, K1A_U02

7. Brief list of topics to be covered

1. Basic information: the design process; structural materials; factors affecting choice of structural material; comparison of properties of structural materials; basic mechanisms of load transfer; member nomenclature; selected structural systems.
2. Actions on structures: forces; types of loads; basic terms; classification of Eurocodes; selected definitions; classification of actions; limit states; combination of actions.
3. Permanent and variable actions: Eurocode 1-1; imposed loads for buildings; categories of use; densities of construction materials.
4. Snow loads: Eurocode 1-3; snow load arrangements; characteristic value of snow load; roof shape coefficient; local effects.
5. Wind action: Eurocode 1-4; wind forces; structural factor; peak velocity pressure; the exposure factor; reference height; wind pressure on surfaces; pressure coefficient.

*- Consultations were not included in the contact hours

**-per semester