1. Course number and name

RB-S1-19-S11-16, **Steel Structures III**

2. Credits and contact hours[*]

4 ECTS, lectures: 15 hours[**], classes: 3 hours[**], project: 12 hours[**]

3. Instructor's or course coordinator's name

Rafal Domagala PhD

4. Text book, title, author, and year

- Farzad Hejazi, Tan Kar Chun: Steel Structures Design Based on Eurocode 3. Springer Verlag, Singapore, 2018.
- A. Boracchini: Design and Analysis of Connections in Steel Structures: Fundamentals and Examples. Wilhelm Ernst & Sohn Verlag fur Architektur und technische Wissenschaften, 2018.

a. other supplemental materials

- EN 1990 Eurocode 0, EN 1991. Eurocode 1. Part 1-1, EN 1991. Eurocode 1. Part 1-3, EN 1991. Eurocode 1. Part 1-4., EN 1991. Eurocode 1. Part 1-5, EN 1993. Eurocode 3. Part 1-1, EN 1993. Eurocode 3. Part 1-8.

5. Specific course information

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

Lectures:

(1) shaping multi-bay industrial halls with supported and suspended transport, (2) shed halls, (3) housing of halls and other steel buildings, solutions and construction details, (4) cooperation of the housing with the steel skeleton, (5) thin-walled purlins, (6) calculation and design solutions for the bases of eccentrically compressed columns (column anchors, rotational stiffness of the column base connection with the foundation), (7) pole shafts contacts, (8) calculation and construction of multi-stage solid and lattice columns (shafts, heads, support of the crane beam), (9) frame structures (static diagrams, basic notes on the static strength analysis, taking into account the type of analysis and the characteristics of nodes, stability checking), (10) frame corners (calculation models, corner shape recommendations).

Classes & Project:

Continuation of the hall project from semester 5 (Steel Structures II), including: (1) static calculations of the transverse system and wall bracings in a single-bay hall without internal transport, (2) dimensioning of the cross-section, head and base of a single-branch column compressed eccentrically, (3) dimensioning of wall bracing sections, (4) construction drawing of the column and bracings.

b. prerequisites or co-requisites

Steel Structures I & II (sem. 4 & 5), Structural Mechanics I & II (sem. 3 & 4)

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

Student knows:

- selected computer programs supporting the calculation and design of structures.
- the standards and guidelines for designing building objects and their elements.
- the rules of mechanics and analysis of bar structures in terms of statics and stability.
- the principles of construction and dimensioning of steel building structure elements and similarly structurally related elements of other steel bar structures.

Student can:

- assess and compile loads acting on building objects and correctly define computational models of the computer structure analysis, then perform a static analysis of statically indeterminate bar structures and critically evaluate the results of this analysis.
- calculate and construct the basic elements of steel structures of buildings (within the scope of the lecture program).

Student is:

- able to work independently or work in a team on a task.
- responsible for the reliability of the obtained results and their interpretation. Formulates conclusions and describes the results of own work.
- communicative in the presentation of work results.

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

K1A_W05, K1A_W06, K1A_U02, K1A_U04

7. Brief list of topics to be covered

The issues of designing industrial halls and their elements as well as frame systems with nodes and contacts are discussed.

*- Consultations were not included in the contact hours

**-per semester