



### 1. Course number and name

RB-S1-19-S11-15, **Steel Structures IIa**

### 2. Credits and contact hours\*

3 ECTS, lectures: 15 hours\*\*, classes: 3 hours\*\*, project: 12 hours\*\*

### 3. Instructor's or course coordinator's name

Szymon Swierczyna PhD

### 4. Text book, title, author, and year

- Handbook of Structural Steelwork - Eurocode Edition. BCSA, Tata Steel & SCI publication number 55/13.
- ECCS: Design of Joints in Steel Structures, Ernst & Son, 2017.

#### a. other supplemental materials

- EN 1993-1-1:2005 Eurocode 3: Design of Steel Structures. Part 1-1: General rules and rules for buildings.
- EN 1993-1-5:2003 Eurocode 3: Design of Steel Structures. Part 1-5: Plated structural elements.
- EN 1993-1-8:2003 Eurocode 3: Design of Steel Structures. Part 1-8: Design of Joints.
- EN 1993-1-2:2003 Eurocode 3: Design of steel Structures. Part 1-2: Structural fire design.
- EN 1994-1-1:2004 Eurocode 4: Design of composite steel and concrete structures. Part 1-1: General rules and rules for buildings.

### 5. Specific course information

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

##### Lectures:

(1) Basic of frame joint design, (2) Structural fire design, (3) Design of bracing, (4) Steel-concrete composite structures, (5) Plate girders with corrugated web, (6) Cellular beams, beams with tie rod, prestressed beams.

##### Classes:

Presentation of the scope and details of the steel hall design: truss field splice, roof bracing, shop drawing of the truss.

##### Project:

Design of truss field splice and roof bracing, shop drawing of the truss scale 1:10.

#### b. prerequisites or co-requisites

Steel Structures (sem. 4), Structural Mechanics (sem. 3 and 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

The student knows:

- student knows the principles of structural design of selected steel and steel-concrete composite members,
- student knows the standards and guidelines for the design of selected steel and steel-concrete members,
- student knows basics of structural fire design of steel structures.

The student can:

- design selected structural steel members and joints,
- design simple steel-concrete composite structure,
- establish fire resistance of steel structure with simple EC3 methods.

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**

1. Frame joint design. End plate bolted joints. Component method. Joint stiffness.
2. Basics of structural fire design. Behavior of steel in fire. Fire safety. Resistance of steel members in fire. Fire protection.
3. Design of bracing members: structural systems and details, loads, imperfections, joints.
4. Steel-concrete composite structures.
5. Basics of design of plate girders with corrugated web.
6. Design of special selected steel members: cellular beams, beams with tie rod and prestressed beams.

\*-Consultations were not included in the contact hours

\*\* -per semester