



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Metal Structures

### Course

Field of study

Building Engineering

Area of study (specialization)

Level of study

First-cycle studies

Form of study

part-time

Year/Semester

4/7

Profile of study

general academic

Course offered in

polish

Requirements

compulsory

### Number of hours

Lecture

18

Laboratory classes

Tutorials

10

Projects/seminars

18

Other (e.g. online)

### Number of credit points

4

### Lecturers

Responsible for the course/lecturer:

dr inż. Robert Studziński

Responsible for the course/lecturer:

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Wydział Inżynierii Lądowej i Transportu

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### Prerequisites

Student knows the basic issues of steel production technologies used in the construction industry and their strength and mechanical properties. Recognizes and characterizes types of welded and bolted connections and explains calculation procedures.

Skilfully applies basic formulas in the field of structural mechanics and material strength. He can adopt appropriate design and technological solutions in the field of anti-corrosion and fire protection. Can propose a design solution for a connection using an appropriate calculation procedure.

Can work independently and cooperate in a group.



### Course objective

Introducing the basic methods of designing metal structure elements and familiarizing with the methods of dimensioning metal structure elements such as beams, columns, trusses.

### Course-related learning outcomes

#### Knowledge

1. Know European standards (EN) and technical conditions of constructing building facilities.
2. Knows detailed rules of constructing and dimensioning elements and metal connections.

#### Skills

1. Can prepare statements of strengths influencing the building units.
2. Are able to design selected elements and simple metal.

#### Social competences

1. Take responsibility for the accuracy and reliability of work results and their interpretation.
2. Can realise that it is necessary to improve professional and personal competence, understand the need and opportunities of continuous learning (Master and PhD studies, post-diploma studies, trainings).

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Passing the lecture - written exam. Auditorium exercises - written test. Design exercises - project execution and its verbal defense.

#### Grading scale:

- 5.0 - the student obtained over 90% of the points in the exam, test and project defense,
- 4.5 - the student obtained from 80% to 90% of the points in the exam, test and project defense,
- 4.0 - the student obtained from 70% to 80% of the points in the exam, test and project defense,
- 3.5 - the student obtained from 60% to 70% of the points in the exam, test and project defense,
- 3.0 - the student obtained from 50% to 60% of the points in the exam, test and project defense,
- 2.0 - the student obtained less than 50% of the points in the exam, test and project defense.

### Programme content

#### Lecture

- hall casing elements,
- static solutions of hall cross systems,



- loads on hall structures according to PN EN 1991,
- load combinations according to PN-EN 19990,
- dimensioning of bending, compression and tension elements
- determination of the critical load capacities in compression and bending,
- shaping trusses,
- shaping hall bracings,

### Design

Steel roof design (bracings, girder).

### Teaching methods

Lectures illustrated with slides and films - problem lecture / seminar lecture / lecture with multimedia presentation. Design exercises - steel roof design (bracings, girder).

### Bibliography

#### Basic

1. Poradnik projektanta konstrukcji metalowych, Bogucki , Arkady , Warszawa , 1982
2. Konstrukcje metalowe cz. I i II, Łubiński, Żółtowski , Arkady , Warszawa , 1992
3. Tablice do projektowania konstrukcji metalowych, Bogucki W., Żybertowicz M, Arkady , Warszawa , 1996

#### Additional

1. PN-EN 1990 Eurokod: Podstawy projektowania konstrukcji
2. PN-EN 1991 Eurokod 1: Oddziaływania na konstrukcje
3. PN-EN 1993 Eurokod 3: Projektowanie konstrukcji stalowych

### Breakdown of average student's workload

	Hours	ECTS
Total workload	100	4,0
Classes requiring direct contact with the teacher	50	2,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) <sup>1</sup>	50	2,0

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