STUDY MODULE DESCRIPTION FORM

Name of the module/subject **Metal Structures**		Code **1010102111010113705**
Field of study **Structural Engineering Second-cycle Studies**	Profile of study (general academic, practical) **(brak)**	Year /Semester **1 / 1**
Elective path/specialty **-**	Subject offered in: **English**	Course (compulsory, elective) **obligatory**
Cycle of study: **Second-cycle studies**	Form of study (full-time,part-time) **full-time**	
No. of hours Lecture: **15** Classes: **-** Laboratory: **-** Project/seminars: **15**		No. of credits **2**
Status of the course in the study program (Basic, major, other) **(brak)**	(university-wide, from another field) **(brak)**	
Education areas and fields of science and art **technical sciences**		ECTS distribution (number and %) **2 100%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	He has knowledge of the mechanics of construction and strength of materials in the field of studies in the field of Building Studies. He knows the methods of designing metal structures in the area of compressed, stretched and bent elements together with construction nodes as well as principles of designing lattice trusses and roof trusses.
2	**Skills**	Uses basic designs in the mechanics of construction and strength of materials. He is able to adopt appropriate design and technological solutions in the field of corrosion protection and fire protection. He is able to propose a design solution using the appropriate calculation procedure, uses building standards for workloads on construction structures, and also in the field of static calculations and dimensioning of steelwork elements.
3	**Social competencies**	He understands the need for lifelong learning and is able to collaborate and work in a team, taking on different roles. He is aware of the responsibility for the profession he is learning.

Assumptions and objectives of the course:

To acquire knowledge and skills in the design and dimensioning of frame systems and concentrations in indoor buildings, the design of eccentrically-squared posts and frames, trusses, skeletal buildings, trusses.

Acquiring knowledge from the types of global analysis.

Understanding the essence of second order analysis and imperfections in steel design.

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. He knows the basic design methods of the main structural components of industrial halls, concentrations and connections - [K_W02, K_W04, K_W14]]

2. Presenting the design issues of spatial truss structures - [K_W04, K_W14]]

3. Discusses examples of failure of steel structures and methods of their prevention - [K_W16]]

Skills:

1. Uses building standards for workloads on construction structures, as well as in static calculation and dimensioning of steel structures - [K_U01, K_U02, K_U03, K_U04, K_U05, K_U07]

2. Can design structural elements of industrial halls and spatial trusses together with the solutions of the main nodes - [K_U09, K_U13]

3. He can indicate sources of failure of steel structures and appropriate methods of their prevention - [K_U12]

Social competencies:

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1. Understands the need for lifelong learning; He can inspire and organize the learning process of others - [K_K02, K_K03, K_K06]
2. He is able to work together and work in a team with different roles - [K_K01]
3. Correctly identifies and resolves dilemmas related to the profession - [K_K07]

Assessment methods of study outcomes

Evaluation of individual student projects combined with oral defense of work.

Examination of lecture content

Grading scale :

Number of percentage points score

91%-100% (A)

81%-90% (B)

71%-80% (C)

61%-70% (D)

51%-60% (E)

below 50% (F)

Course description

Form of classes: lectures, Lecture problem / conversational lecture / lecture and multimedia presentation. Exam - written test.

Methods of construction and dimensioning of frame systems (static schemes, loads, dimensioning of eccentrically squared posts and frame bolts, details of connections). Principles of construction and dimensioning of bracing in buildings. Types of global analyzes in dimensioning steel structures. Imperfections. Basic information on spatial design of steel trusses.

Form of classes: projects - oral defense of a project.

Design of a steel hall with a bracing system

Basic bibliography:

1. Z. Kurzawa, K. Rzeszut, M. Szumigała, Stalowe Konstrukcje Prętowe cz III wyd. PP 2015.

2. Bródka Jan, Broniewicz Mirosław, Giżejowski Marian: Kształtowniki gięte. Poradnik projektanta; Wydanie I, Polskie Wydawnictwo techniczne Rzeszów 2006

3. Biegus Antoni: Stalowe budynki halowe; Wydawnictwo ARKADY Sp. z o.o., Warszawa 2008

4. Structural Stability of Steel: Concepts and Applications for Structural Engineers, Theodore V. Galambos, Andrea E. Surovek, John Wiley & Sons , 2008

5. Structural Design of Steelwork to EN 1993 and EN 1994, , Lawrence Martin, Elsevier, 2007

Additional bibliography:

1. EN-1993-1-1

2. EN-1993-1-8

3. EN-1990

4. EN-1991-1-1

5. EN-1991-1-3

6. EN-1991-1-4

Result of average student's workload

Activity	Time (working hours)
1. Participation in lectures	15
2. Participate in design exercises	15
3. Working with a project at home	15
4. Participate in consultations on lectures and design exercises	5

Student's workload

Source of workload	hours	ECTS
Total workload	50	2
Contact hours	1	1

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Practical activities	1	1

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