SYLLABUS AND COURSE REQUIREMENTS
2023/2024. I. SEMESTER

Title	**Steel Structures 3.**
Course code	**MSB390ANEP**
Weekly hours: lect/pract/lab	**2 / 2 / 0**
Credit points	**4**
Curriculum(s)/ type	**Civil Engineering BSc./ obligatory**
School	**full time**
Requirement	**exam**
Registration semester	**fall semester**
Pre-requirement(s)	**MSB380ANEP Steel structures 2**
Gestor Department(s)	**Department of Civil Engineering**
Responsible and lecturers	**Dr. Attila FÜLÖP associate professor**

COURSE DESCRIPTION

The goal of the semester is that the students should learn the conventional steel structures, and should be able to solve the design of the execution drawings independently.

SYLLABUS

1. GOALS AND OBJECTIVES

Brief Syllabus: This subject aims to provide a theoretical and practical knowledge necessary for the design, production and mounting of steel buildings used in engineering and includes the following topics: Steel buildings: Structural systems and load-bearing systems of simple steel buildings. Secondary load-bearing systems of simple steel buildings. Roofing, steel walls, sheeting, basics of strength design. Detailed elastic and plastic design of the main load-bearing structural elements: beam, columns, frames. Structural connections of the main frames': beam-to-beam, beam-to column and column-base connections (according to Eurocode 3 part 1-8). Structural solutions of bracings, sections, connections and design. Cranes in steel buildings. Multi-storey steel buildings: Static models, structural details, steel-concrete composite structural solutions. Design process and theories at multi-storey buildings. Bracing solutions. Dimensioning of bracings' elements, structural connections (welded, bolted), coverings and slab systems. Special design solutions of steel truss systems (arrangement, sections, joint solutions, analysis and strength design. Cable structures: Structural solutions, applied sections, topology, theory of design.

Bracings, coverings, assembly techniques. Theoretical basis of the design of welded, class 4 cross-sectioned structural elements.To complete the course students must be able to create a technically and aesthetically suitable solution for building with steel structures.

2. COURSE CONTENT

	TOPICS
LECTURE + PRACTICE	1. *Introduction, Eurocode 3* 2. *Steel buildings I.: Structural systems and load-bearing systems of simple steel buildings.* 3. *Steel buildings II.: Secondary load-bearing systems of simple steel buildings. Roofing, steel walls, sheeting, basics of strength design.* 4. *Steel buildings III. Detailed elastic and plastic design of the main load-bearing structural elements: beam, columns, frames.* 5. *Steel buildings IV.: Structural connections of the main frames': beam-to-beam, beam-to column and column-base connections (according to Eurocode 3 part 1-8).* 6. *Steel buildings V.: Structural solutions of bracings, sections, connections and design. Cranes in steel buildings.* 7. *Multi-storey steel buildings I: Static models, structural details, steel-concrete composite structural solutions.* 8. *Multi-storey steel buildings II: Design process and theories at multi-storey buildings. Bracing solutions.* 9. *Multi-storey steel buildings III: Dimensioning of bracings' elements, structural connections (welded, bolted), coverings and slab systems.* 10. *Special design solutions of steel truss systems (arrangement, sections, joint solutions, analysis and strength design.* 11. *Cable structures: Structural solutions, applied sections, topology, theory of design. Bracings, coverings, assembly techniques.* 12. *Theoretical basis of the design of welded, class 4 cross-sectioned structural elements.*

DETAILED SYLLABUS AND COURSE SCHEDULE

LECTURE AND PRACTICE

week	**Topic**	**Compulsory reading; page number (from … to …)**	**Required tasks (assignments, tests, etc.)**	**Completion date, due date**
1.	*Introduction, Eurocode 3*			
2.	*Steel buildings I.: Structural systems and load-bearing systems of simple steel buildings.*	[2]		
3.	*Steel buildings II.: Secondary load-bearing systems of simple steel buildings. Roofing, steel walls, sheeting, basics of strength design.*	[2]		
4.	*Steel buildings III. Detailed elastic and plastic design of the main load-bearing structural elements: beam, columns, frames.*	[2]		
5.	*Steel buildings IV.: Structural connections of the main frames': beam-to-beam, beam-to column and column-base connections (according to Eurocode 3 part 1-8).*	[2]		

6.	*Steel buildings V.: Structural solutions of bracings, sections, connections and design. Cranes in steel buildings.*	[2]		
7.	*Multi-storey steel buildings I: Static models, structural details, steel-concrete composite structural solutions.*	[2]		
8.	*Multi-storey steel buildings II: Design process and theories at multi-storey buildings. Bracing solutions.*	[2]		
9.	National holiday (1st of November)			
10.	*Multi-storey steel buildings III: Dimensioning of bracings' elements, structural connections (welded, bolted), coverings and slab systems.*	[2]		
11.	*Special design solutions of steel truss systems (arrangement, sections, joint solutions, analysis and strength design.*	[2]		
12.	*Cable structures: Structural solutions, applied sections, topology, theory of design. Bracings, coverings, assembly techniques.*	[2]		
13.	*Theoretical basis of the design of welded, class 4 cross-sectioned structural elements.*	[2]		

3. ASSESSMENT AND EVALUATION

Attendance: In accordance with the Code of Studies and Examinations of the University of Pécs, Article 45 (2) and Annex 9. (Article 3) a student may be refused a grade or qualification in the given full-time course if the number of class absences exceeds 30% of the contact hours stipulated in the course description. To be in class at the beginning time and stay until the scheduled end of the lesson is required, tardiness of more than 20 minutes will be counted as an absence. In the case of an illness or family emergency, the student must present a valid excuse, such as a doctor's note.

Method for monitoring attendance

attendance sheet

Mid-term assessments, performance evaluation and their weighting as a pre-requisite for taking the final exam

Type	Assessment	*Weighting as a proportion of the pre-requisite for taking the exam*
1. *home assignment (project documentation)*	*max 90 points*	*90 %*
2. *attendance*	*max 10 points*	*10 %*

Requirements for the end-of-semester signature

mid-term assessment of 40%

Re-takes for the end-of-semester signature (PTE TVSz 50§(2))

The specific regulations for grade betterment and re-take must be read and applied according to the general Code of Studies and Examinations the assignment to be submitted can be repeated/improved each once every semester, and the home assignments can be repeated/improved at least once in the first two weeks of the examination period.

Type of examination *(written, oral): oral*

The exam is successful if the result is minimum 40 %.

Calculation of the grade *(TVSz 47§ (3))*

The mid-term performance accounts for ***50*** %, the performance at the exam accounts for ***50*** % in the calculation of the final grade.

Calculation of the final grade based on aggregate performance in percentage.

Course grade	Performance in %
excellent (5)	85 % -...
good (4)	70 % ... 84 %
satisfactory (3)	55 % ... 69 %
pass (2)	40 % ... 54 %
fail (1)	below 40 %

The lower limit given at each grade belongs to that grade.

COMPULSORY READING

[1st] Iványi, M. - Skaloud, M.: Stability Problems of Steel Structures (in English) CISM Courses and Lectures No 323, International Centre for Mechanical Sciences, SPRINGER - Verlag, Wien - New York, 1992, p. 415.

[2nd] Lecture notes on the O: drive

RECOMMENDED LITERATURE

[3rd] Alexander Reichel, Peter Ackermann, Alexander Hentschel, Anette Hochberg, Building with Steel, 2007.

[4th] Iványi, M. - Skaloud, M.: Stability Problems of Steel Structures (in English) CISM Courses and Lectures No 323, International Centre for Mechanical Sciences, SPRINGER - Verlag, Wien - New York, 1992, p. 415.

[5th] Iványi, M. - Skaloud, M.: Steel Plated Structures (in English), CISM Courses and Lectures No 358, International Centre for Mechanical Sciences, SPRINGER - Verlag, Wien - New York, 1995, p. 373.

[6th] Iványi, Miklós: ORTHOTROPIC STEEL BRIDGES. Theory, Design and Construction (in English) Helsinki Technical University, Laboratory of Bridge Engineering, TKK-SRT-33 Műegyetemi Kiadó, Budapest, 2003, p. 323.

[7th] Iványi, Miklós - Iványi, Péter: EUROCODE Manual: Design of Multi-storey Steel Buildings (in English-Hungarian) POLLACK PRESS, Pécs, 2008, p. 380.

[8th] Iványi, M. Miklós - Bancila, Radu - Iványi, Péter - Iványi, Miklós: Stability and Ductility of Planar Plated Steel Structures (in English) POLLACK PRESS, Pécs, 2010, p.305.

[9th] Iványi, M. Miklós - Iványi, Miklós - Iványi, Péter: Multi-Storey Steel Frames with Semi-Rigid Connections. Experimental Analysis (in English) POLLACK PRESS, Pécs, 2011, p. 175.

[10th] Iványi, M. Miklós - Iványi, Miklós: Refurbishment of Steel Bridges (in English) POLLACK PRESS, Pécs, 2011, p. 107.

[11th] Iványi, M. Miklós - Iványi, Miklós: Plastic Design of Steel Structures (in English) POLLACK PRESS, Pécs, 2013, p. 157.