COURSE SYLLABUS SEMESTER FALL 2021/2022

Name of Course	**Steel Structures 3.**
Course code	**MSB390ANEP**
Weekly hours: lect/pract/lab	**2 / 2 / 0**
Number of Credits	**4**
Program	**Civil Engineering BSc./ obligatory**
Evaluation	**exam**
Semester	**fall semester**
Prerequisites	**MSB380ANEP Steel structures 2**
Department	**Department of Civil Engineering**
Responsible and lecturers	**Dr. Attila FÜLÖP associate professor**

OBJECTIVES

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.

CONTENTS

General Course Description and Main Content:

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.

Schedule:

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 I.: Structural solutions, applied sections, topology, theory of design.
12. Cable structures II.: Bracings, coverings, assembly techniques.
13. Theoretical basis of the design of welded, class 4 cross-sectioned structural elements.
14. Exam

EVALUATION AND GRADING

Attendance: Attending is required all classes. In case of unexcused absence from more than 30% of the total number of lesson will be grounds for failing the class. 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.

Signature / Grading: The grading is based on the semester homework project 40%, end semester exam 50% and attendance 10%. Details is discussed on the practice.

Grading Scale:

0 – 50 % failed (1)
51 – 62 % passed (2)
63 – 75% satisfactory (3)
76 – 87 % good (4)
88 – 100 % excellent (5)

READINGS AND REFERENCE MATERIALS

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

[2.] 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.

[3.] 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.

[4.] 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.

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

[6.] 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.

[7.] 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.

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

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

SCHEDULE

	TEACHING PERIOD, TEACHING WEEKS														EXAM PERIOD				
2021/2022. I. SEMESTER	**1.**	**2.**	**3.**	**4.**	**5.**	**6.**	**7.**	**8.**	**9.**	**10.**	**11.**	**12.**	**13.**	**14.**	**15.**	**1.**	**2.**	**3.**	**4.**	**5.**
Number of Lecture and Practice	1	2	3	4	5	6	7		8	9	10	11	12	13	14			Signature, midsemester grade can not be fulfil		
Laboratory																				
Exams															x					
Signature and midsemester grade															sign.					
Planed exam time																				

6th September 2021.

Dr. Attila FÜLÖP

responsible lecturer