COURSE SYLLABUS SEMESTER FALL 2020/2021

Name of Course	**Steel Structures 1.**
Course code	**MSB397ANEP**
Weekly hours: lect/pract/lab	**2 / 2 / 0**
Number of Credits	**4**
Program	**Civil Engineering BSc./ obligatory**
Evaluation	**exam**
Semester	**autumn semester**
Prerequisites	**MSB401MNEP Strength of materials 1., MSB378MNEP Basics of structural design**
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: This subject aims to provide a theoretical and practical knowledge necessary for the design, production and mounting of steel structures used in engineering and includes the following topics: definition, types and division of steel structures, their advantages and disadvantages; design principles and methodology; Eurocode 3; components of steel bars, basic materials, different joints; compressed bars; design of trusses; relationship between the built environment and steel structures; modelling steel materials; design principles; process of planning steel structures; structural bars: classification, structural design, limit states, standard dimensions; bars and beams subject to eccentric tension or compression; bolted, riveted and welded joints: classification, technology and application; design, application and dimensioning of simple structures, latticed and solid-web girders, split-section beams; stability limit states of structural bars, turning out and plate buckling; effects of strength and stability on the behaviour of structural bars, design principles; structural design, behaviour and dimensioning of beam-to-beam and beam-to-column joints; classification, application and construction principles of complex steel structures; harmonising the design of steel structures and artistic viewpoints.

To complete the course students must be able to create a technically and aesthetically suitable solution for building with steel structures.

Schedule:

1. Introduction. Course description. Orientation.
2. Introduction, Eurocode 3
3. Definition, types and division of steel structures, their advantages and disadvantages, modelling steel materials.
4. Components of steel bars, basic materials, different joints.
5. Design of trusses, compressed bars, structural bars: classification, structural design, limit states, standard dimensions.
6. Bars and beams subject to eccentric tension or compression.
7. Bolted, riveted and welded joints: classification, technology and application.
8. Structural design, behaviour and dimensioning of beam-to-beam and beam-to-column joints.
9. Process of planning steel structures: design, application, design principles and methodology.
10. Dimensioning of simple structures, latticed and solid-web girders, split-section beams.
11. Effects of strength and stability of the behaviour of structural bars, design principles.
12. Stability limit states of structural bars, turning out and plate buckling.
13. Classification, application and construction principles of complex steel structures.
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				
2020/2021. 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																				

7th September 2020.

Dr. Attila FÜLÖP

responsible lecturer