# SYLLABUS AND COURSE REQUIREMENTS 2021/2022. II. SEMESTER

Title	Steel Structures 2
Course code	MSB380ANEP
Weekly hours: lect/pract/lab	1/2/0
Credit points	4
Curriculum(s)/ type	Civil Engineering BSc./ obligatory
School	English
Requirement	exam
Registration semester	spring semester
Pre-requirement(s)	MSB379ANEP Steel Structures 1.
Gestor Department(s)	Department of Civil Engineering
Responsible and lecturers	Dr. Attila FÜLÖP associate professor

#### INTRODUCTION, LEARNING OUTCOMES

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

#### CONTENT

**General Course Description and Main Content:** Design of steel beams: classification, design of class 4 sections subjected to bending. Design of steel beams: stability design, lateral torsional buckling, shear buckling. Design of bar elements subjected to normal force and bending (N+M). Stability design of bar elements subjected to normal force and bending. Application of component method at bolted connections. Global analysis of steel bar elements. Application of first and second order analysis. Imperfections. Coupled steel columns under compression. Plastic analysis of steel elements

#### Lecture and Practice:

- 1. Introduction.
- 2. Design of steel beams: classification, design of class 4 sections subjected to bending.
- 3. Design of steel beams: stability design, lateral torsional buckling, shear buckling.
- 4. Design of bar elements subjected to normal force and bending (N+M)

- 5. Stability design of bar elements subjected to normal force and bending (N+M)
- 6. Bolted and welded connections of steel bar elements subjected to normal force and bending.
- 7. Application of component method at bolted connections.
- 8. Global analysis of steel bar elements.
- 9. Application of first and second order analysis. Imperfections.
- 10. Coupled steel columns under compression.
- 11. Plastic analysis of steel elements
- 12. Exam

#### EVALUATION AND GRADING

**Attendance:** Attending is required all classes. In case of unexcused absence from more than 30% of the total number of lessons 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 exam grade is based on a semester project (steel deck) 45 %, end semester exam 50 % and attendance 5 %. Details is discussed on the practice.

#### **Grading Scale:**

85 – 100 %	A (5, jeles, excellent, sehr gut)
71 – 84 %	B (4, jó, good, gut)
60 – 70%	C (3, közepes, avarage, befriedigend)
50 – 59 %	D (2, elégséges, satisfactory, genügend)
0 – 49 %	F (1, elégtelen, fail, ungenügend)

#### MASKING REQUIRED INDOORS

The University of Pécs requires masking indoors for both vaccinated and unvaccinated individuals per the following:

- Masks should properly cover both the nose and mouth.
- More protective surgical, KN95 or N95 masks are highly recommended; bandanas and gators are not permitted.
- Faculty may unmask while teaching if 4 m of distance is maintained. All students must always wear masks.
- Individuals may only remove masks indoors when:
  - $\circ$  in an enclosed room alone.
  - o actively eating or drinking.

#### **RECOMMENDED READINGS**

- [1st] Alexander Reichel, Peter Ackermann, Alexander Hentschel, Anette Hochberg, Building with Steel, 2007.
- [2nd] 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.
- [3rd] 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.
- [4th] 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.
- [5th] Iványi, Miklós Iványi, Péter: EUROCODE Manual: Design of Multi-storey Steel Buildings (in English-Hungarian) POLLACK PRESS, Pécs, 2008, p. 380.
- [6th] 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.
- [7th] 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.
- [8th] Iványi, M. Miklós Iványi, Miklós: Refurbishment of Steel Bridges (in English) POLLACK PRESS, Pécs, 2011, p. 107.
- [9th] 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. II. 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	5	6	7	8		9	10	11						
Exams																		Sig	e,	
Homework		×					×								×			grad	not	
Signature and midsemester grade															sig n.			b	1	
Planed exam time																				

10<sup>th</sup> February 2022.

### Dr. Attila FÜLÖP

responsible lecturer