SYLLABUS AND COURSE REQUIREMENTS
2019/2020. II. SEMESTER

Title	**Strength of Materials 1**
Course code	**MSB401ANEP**
Weekly hours: lect/pract/lab	**1 / 2 / 1**
Credit points	**4**
Curriculum(s)/ type	**Civil Engineering BSc./ obligatory**
School	**English**
Requirement	**exam**
Registration semester	**spring semester**
Pre-requirement(s)	**MSE256ANEP Mechanics 1. (Statics)**
Gestor Department(s)	**Department of Civil Engineering**
Responsible and lecturers	**Dr. Attila FÜLÖP associate professor, András DORMÁNY, assistant professor**

INTRODUCTION, LEARNING OUTCOMES

Students continue to learn the fundamentals of mechanics, compression and stressing of bar structures, which helps them with dimensioning basic structural components of construction and selecting the most appropriate materials. To assist with this, students learn the rules of technical and building constructional representations and various structural systems.

CONTENT

General Course Description and Main Content: In particular, students cover the following topics: stress and deformation, Hooke's Law, axial pre-stressing and compression of bar structures, pure shear, design of bolted joints, wooden joints, bending stress, perpendicular and oblique bending, shear stresses with simultaneous bending, eccentric stresses of materials with and without tension strength.

Lecture and Practice:

1. Introduction. Course description. Orientation.
2. Introduction. Geometrical properties. Centroid, first and second moments of inertia.
3. Product of inertia, principal directions.
4. Stresses. Principal stresses. Mechanical properties of materials.
5. Strains. Normal strain, shear strain, cartesian strain components. Transverse contraction.
6. Normal stresses in case of axial loading.
7. Mechanical properties of materials. Stress-strain diagrams. Elastic and plastic behaviour. Hooke's law. Design of cross sections.

8. Shear stresses in case of simple shear.
9. Bolted joints in single and double shear. wooden joints.
10. Pure torsion
11. Simple and coupled bending
12. Shear stresses with simultaneous bending, Zhuravskiy's formula.
13. Exam

Laboratory:

1. Introduction to Axis VM finite element program.
2. Geometrical properties and modelling.
3. Truss-design and axial loadings.
4. Simple beam design 1.
5. Simple beam design 2.
6. Frame design.

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 grading based on the semester homework project 15%, mid semester exam 35%, end semester exam 35%, Axis homework 10% and attendance 5%. Details are 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)

RECOMMENDED READINGS

[1st] Russel C. Hibbeler, Mechanics of Materials (9th Edition), ISBN-13: 978-0133254426
[2nd] Wight, J. K, MacGregor J. Reinforced concrete mechanics & design, Pearson, 2012.
[3rd] Riley, Mechanics of Materials, ISBN-13: 978-0471705116

SCHEDULE

	TEACHING PERIOD, TEACHING WEEKS															EXAM PERIOD				
2019/2020. 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	6	7	8	9	10	10		11	12	13			Signature, midsemester grade can not be fulfil		
Laboratory			1		2		3		4				5		6					
Exams									×					x	×					
Signature and midsemester grade															sign.					
Planed exam time																				

3rd February 2020.

Dr. Attila FÜLÖP

responsible lecturer