SYLLABUS AND COURSE REQUIREMENTS
2020/2021. 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,** **Lujain BEN KHADRA technical supporting staff**

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. Product of inertia, principal directions.
3. Stresses. Principal stresses. Mechanical properties of materials. Strains. Normal strain, shear strain, cartesian strain components. Transverse contraction.
4. Normal stresses in case of axial loading. Mechanical properties of materials. Stress-strain diagrams. Elastic and plastic behaviour. Hooke's law. Design of cross sections.
5. Shear stresses in case of simple shear. Bolted joints in single and double shear. wooden joints.

6. Pure torsion, simple and coupled bending
7. Shear stresses with simultaneous bending, Zhuravskiy's formula.

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 exam grade is based on homeworks 60%, end semester test 25%, Axis homework 10% 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				
2020/2021. 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	1		2		3		4		5		6		7					Signature, midsemester grade can not be fulfil		
Number of Practice	1	2	3	4	5	6		7	8		9	10	11	12	13					
Laboratory		1		2		3		4				5		6						
Exams														x	×					
Signature and midsemester grade															sign.					
Planed exam time																				

2nd February 2021.

Dr. Attila FÜLÖP

responsible lecturer