

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:

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 the semester results: practice homework 60%, and lecture homework 25%, Axis homework 10% attendance 5% and written exam result 100%. Details are discussed on the practice.

Grading Scale:

170 – 200 %	A (5, jeles, excellent, sehr gut)
142 – 169%	B (4, jó, good, gut)
120 – 141%	C (3, közepes, average, befriedigend)
100 – 119 %	D (2, elégséges, satisfactory, genügend)
0 – 99 %	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:
 - in an enclosed room alone.
 - actively eating or drinking.

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				
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	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	x					
Signature and midsemester grade															sig n.					
Planed exam time																				

8th February 2022.

Dr. Attila FÜLÖP

responsible lecturer