

BME Department of Mechanics, Materials and Structures				
STRENGTH OF MATERIALS II.			CODE: BME EPST A401	
FULFILLMENT	CREDIT	SESSION	SEMESTER	YEAR
PRACTICAL MARK	6	2022/2023	SPRING	II.
LECTURER: Dr. Sajtos, István		PRACTICAL TEACHER: Rita Vajk, Dániel Friedrich		

## TOPICS SCHEDULE

Week Calendar	Date	LECTURES Monday: 10:15-12:00 Room: K.3.43 Thursday: 8:15-10:00 Room: K.3.43	Date	PRACTICALS Thursday: 10:15-12:00 Room: K.3.43
1.	27. 02.	Static analysis of structures: static determinacy, indeterminacy, over determinacy		
9.	02. 03.	Elastic energy. External and internal spontaneous work. Imposed (virtual) work method	02. 03.	P.1. Static analysis of structures: internal forces, static determinacy, indeterminacy, over determinacy
2.	06. 03.	Virtual work method, <b>displacement calculation</b>		P.2. Work methods: spontaneous work and imposed (virtual) work, displacement calculation
10.	09. 03.	Virtual work method, displacement calculation	09. 03.	
3.	13. 03.	<b>Force method:</b> one degree statically indeterminate structures		
11.	16. 03.	Force method: more than one degree statically indeterminate structures	16. 03.	P. 3. Displacement calculation by virtual work method
4.	20. 03.	Force method: kinematic loads, stiffness of beams		
12.	23. 03.	<b>TEST 1:</b> Virtual work method, static determinacy, indeterminacy, over determinacy	23. 03.	P.4. Force method: one degree statically indeterminate structures
5.	27. 03.	<b>Plastic theory</b> of beams and frames		P.5. Force method: more than one degree statically indeterminate structures, kinematic loads
13.	30. 03.	<b>Displacement method.</b> Stiffness of beams. Cross method: frames with one internal joint	30. 03.	
6.	03. 04.	<b>RETAKE 1</b>		
14.	06. 04.	EASTER HOLIDAY	06. 04.	EASTER HOLIDAY
7.	10. 04.	EASTER HOLIDAY		
15.	13. 04.	PRELIMINARY DESIGN WEEK	13. 04.	PRELIMINARY DESIGN WEEK
8.	17. 04.	<b>P.6.</b> Plastic theory of beams		
16.	20. 04.	Cross method: no-sway frames and multi-supported beams	20. 04.	P.7. Cross method: no-sway frames with one internal joint
9.	24. 04.	<b>TEST 2:</b> Force method, plastic theory of beams.		P.8. Cross method: no-sway frames with two or more internal joints, <i>support settlement</i>
17.	27. 04.	Cross method: kinematic loads (support settlement, thermal effects)	27. 04.	
10.	01. 05.	HOLIDAY		P.9. Cross method: no-sway frames, <i>thermal effects, symmetry-antisymmetry, support settlement</i>
18.	04. 05.	<b>Finite Element Method</b> of plane frames	04. 05.	
11.	08. 05.	Finite Element Method of plane frames		
	11. 05.	<b>Bracing system</b> of buildings.	11. 05.	P.10. Finite Element Method
12.	15. 05.	Bracing system of buildings.		
19.	18. 05.	<b>Buckling</b> of columns	18. 05.	P.11. Bracing systems
13.	22. 05.	Preparation for Global Exam		
20.	25. 05.	<b>TEST 3:</b> Cross method, bracing systems	25. 05.	P.12. Buckling.
14.	29. 05.			
	01. 06.	DRAUGHTING WEEK	01. 06.	DRAUGHTING WEEK
15.	07. 06.	<b>RETAKE 2.</b> <b>RETAKE 3.</b>		
22.	Wed.			

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## CONDITIONS OF FULFILMENT FOR SUBJECT STRENGTH 2.

<b>CONDITIONS OF SIGNING FOR THE SUBJECT</b>	1. To get the credit points of subject Mathematics 2. and Strength of Materials 1. 2. To register for the subject in the NEPTUN system.
<b>TYPE OF CLASSES</b>	- lectures - practicals Students should make notes during the lectures and practicals. - tests: are prepared alone, without any help and without notes, and must be submitted at the end of the lesson
<b>TASKS</b>	- <b>3 tests:</b> tests score between 0 and 120 points, in case of absence 0 points. The date of the tests are announced in the schedule. If any of the tests does not reach 60 points, then it has to be repeated. Repetition (retake) test score overwrites the former test score. We give the opportunity to revise and repeat the test according to the schedule. Only ONE retake for each test is organised. Further chance is not given for repetition. - Homework exercises for altogether 40 points (HW exercises): HW exercises are uploaded weekly in the Moodle, connected to the Practicals. These help the preparation to the Tests. Submission of homework is <b>optional</b> . The points for the homework increases the semester points if the minimum test points are achieved.
<b>CONDITIONS OF FULFILMENT</b>	1. Attending <b>at least 70 %</b> of the <b>practical lessons</b> , and at least <b>70 %</b> of the <b>lecture lessons</b> (attendance is mandatory and it will be checked regularly). 2. To <b>pass each test</b> (to achieve <b>at least 60 points out of 120 points</b> in the test or in the repetition test). If the above detailed conditions are not fulfilled, the student gets a fail (1) mark, and must repeat the semester. This mark cannot be revised.
<b>MARK</b>	The semester will be closed by a practical mark, based on the semester work (3 tests and homework exercises); this mark will be the base of the credit points. The <b>total points</b> are calculated as the sum of the three test points and the homework points. Calculation of the <b>mark</b> : The semester points: Test1+Test2+Test3+Homework  0 - 179 total points: 1 (fail) 180 - 239 total points: 2 (pass) 240 - 279 total points: 3 (satisfactory) 280 - 339 total points: 4 (good) 340 - 400 total points: 5 (excellent)
<b>Recommended notes</b>	- Irving H. Shames: <b>Introduction to Solid Mechanics</b> , Prentice Hall, 1989 * - R.C.Hibbeler: <b>Structural Analysis</b> , 7th edition on SI Units. Prentice Hall, 2006 * - R.C.Hibbeler: <b>Mechanics of Materials</b> , Prentice Hall, 2008 or 2011. * - Strength of materials II. (Collection of examples)** - Strength of materials II. (Lecture notes by Ms. M. Gimesy)** - Domokos: Strength of Materials 2 ** * it can be borrowed from BME Library. ** it will be available in Moodle

BME Department of Mechanics, Materials and Structures				
GLOBAL EXAM OF STRENGTH OF MATERIALS			CODE: BME EPST A499	
FULFILMENT	CREDIT	SESSION	SEMESTER	YEAR
GLOBAL EXAM	-	2022/2023	SPRING	II.
LECTURER: Dr. Sajtos, István		PRACTICAL TEACHER: Dr. Ágnes Csicsely		

## CONDITIONS OF FULFILMENT FOR SUBJECT GLOBAL EXAM OF STRENGTH OF MATERIALS

<b>CONDITIONS OF SIGNING FOR THE SUBJECT</b>	1. Obtaining the credit points of subject Strength 1 and to register for subject Strength 2. 2. Signing for the subject in the NEPTUN system.
<b>CONDITIONS OF TAKING THE GLOBAL EXAM</b>	Obtaining the mark of subject Strength of Materials 2. Register on the exam date via NEPTUN system successfully. In case of absence of the exam a procedure fee is to be paid. Interrupted exams mean fail mark.
<b>EXAM DATES</b>	According to the NEPTUN system.
<b>ABOUT THE EXAM</b>	There will be a written exam and an oral exam (on the following day at 9.00 o'clock). - written part: The written exam consists of two parts of 90 minutes for each part. The problems will be from the topic of <b>Statics, Strength 1.</b> and <b>Strength 2.</b> Bring with you the fixed-end moment table. - oral part: we will inform you via Neptun message where to go to the oral part; it takes about 20-30 minutes (which contains a short preparing period as well); you will get 2 questions: one question from Statics or Strength 1 topic, and one question from Strength 2 topic; there will be no calculation problem. In case of online exam after the exam we will call each participant for a short talk to make sure that the submitted exam is their own product.
<b>GLOBAL MARK</b>	<b>Written exam:</b> max. 240 points (minimum <b>120 points</b> must be achieved): 1 <sup>st</sup> part: max 120 p. 2 <sup>nd</sup> part: max 120 p. Only students who pass the written part may sit for the oral part. <b>Oral exam:</b> max. 120 points (minimum <b>60 points</b> has to be achieved). <b>Total exam points =</b> written part score + oral part score  0 - 179 points: <b>1</b> (fail) 180 - 219 points: <b>2</b> (pass) 220 - 259 points: <b>3</b> (satisfactory) 260 - 299 points: <b>4</b> (good) 300 - 360 points: <b>5</b> (excellent)
<b>REPETITION OF THE GLOBAL EXAM</b>	In case of failure the global exam may be revised in the exam period as a "Repetition exam" fulfilling the conditions of the subject. Repeating a successful global exam can be performed according to the prescriptions of the "Code of Studies and Exams".
<b>Recommended notes</b>	The notes listed for Statics, Strength of Materials 1 and Strength of Materials 2.