TUB Faculty of Architecture	Department of Mechanics, Materials and Structures					
Subject: **FUNDAMENTALS OF STRUCTURES**		Code	Credit points	Date:	Semester:	Year:
Dr András Sipos Dr András Draskóczy		BME EPSTG201	0	14/15	2nd	Gen. Course

TOPICS SCHEDULE

Week	Date	**Tuesdays 12.15-14.00 K221** Dr András Draskóczy	Date	**Thursdays 15.15-17.00 K221** Dr András Sipos
1.	10.02	1**. Introduction**: the aims of the course. Buildings. Functions and requirements. Materials and structures. Design of buildings. Loads	12.02.	B1. Dimensions. Basic properties of functions. Basics of kinematics
2.	17.	2. 1st site visit: an existing, functioning building. The Central Building of the TUB. **Parts of buildings**	19.	B2. Real numbers. Slope of a function. Kinematics II.
3.	24.	3. Discussion of experiences of the 1st site visit. **Requirements** of the built environment. Load-bearing requirements	26.	B3. Scalars - vectors. Netonian principles of machanics. Force.
4.	03.03.	4. Responses of the structural materials when being loaded The notion of stresses and deformations. 2nd visit: **laboratory testing** of structural materials (timber, steel, concrete)..	05.03..	B4. Trigonometry. Netonian principles of machanics II. Force. Euilibirum of forces in 2D.
5.	10.	5. Improving the practice of problem solution, examples. Discussion of experiences of the 2nd site visit: Characteristics of structural materials. **Statistical evaluation of** measurement data: **material strength**. The notion of safety.	12.	**MP1. Components of forces. Resultant and equilibrium of forces in 2D.**
6.	17.	6. Distribution of MP1, discussion of the typical problems **Film projection** (loads, behaviour of structural materials)	19.	**Test 1: Components of forces. Resultant and equilibrium of forces in 2D.**
7.	24.	7. 3rd site visit: a **construction site**. Load-bearing parts of buildings	26.	B5. Gravity. Mass and weight. Loads.
8.	31.	8. Improving the practice of problem solution, examples. Discussion of experiences of the 3rd site visit (I). **Structural modelling**, the static model of load-bearing structures. Functions of structures, requirements	02.04.	B6. Circular motion.
9.	07. 04.	9. Improving the practice of problem solution, examples. Discussion of experiences of the 3rd site visit (II). Responses of load-bearing structures when loaded. **Limit states.** Fundamental laws of structural analysis	09.	B7. Vector product. Moment. Couple of forces.
10.	14.	10. 4th site visit: a **project bureau**	16.	B8. Area under a function. Energy and power. Variational view of mechanics.
11.	21.	11. Improving the practice of problem solution, examples Discussion of experiences of the 4th site visit (I). The **process of creation**. Parties contributing to design and realization of works of art of architecture.	23.	**MP2: General coplanar force systems**
12.	28.	Distribution of MP2, discussion of the typical problems	30.	**Test 2: General coplanar force systems.**
13.	05. 05.	12**.** Improving the practice of problem solution, examples. Discussion of experiences of the 4th site	07.05.	Summary of problems treated in the course

		visit (II). Parts and kinds of **documentations of buildings**. Scales and graphical symbols. Structural projects		
14.	12.	13. Consultation for the test repetition. Solution of problems.	14.	**Test repetition**

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REQUIREMENTS

Conditions of inscription:	-Registration of the subject Fundamentals of Structures
Character of the lessons:	Lectures and practical lessons in small groups, laboratory and site visits. Types of practical lessons: B: blackboard exercise, problems are solved at the blackboard by the practical teacher MP: marked practical, work done by help of the teacher T: test, individual work (no aids can be used, only the calculator)
Prescriptions for presence:	Presence is **obligatory** and will be regularly checked.
Mid-semester controls (dates as given in topics schedule):	Two 90 Minutes tests (T), max. 120 points each, 0 point in case of absence. Points given for theory and problem solution of tests will be valuing 33 and 67% respectively. For supplying one missing test or improving the worse test one occasion will be given at the end of the semester. Theme of this test will range the whole material of the semester. Its points will substitute that of the missed/improved test. **There is no other possibility to improve the test results.** Two 90 minutes marked practical exercises (MP), valuing 12 points max. each, 0 point in case of absence. **There is no possibility for supplying or improving MP-s**.
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Conditions of signature:	1. Presence on at least 70% of lessons (max.2x 3 absences) 2. 60 points mean of the test results 3. Achievement of at least 120 points from the total of 240 points that can be given as maximum for the term work, determined as given below: 0,9xΣTwo test results + ΣMP results
Mid-semester mark:	Min. 50% of the total of. 240 points should be achieved. Final mark: 0-119 points fail (1) 120-144 points pass (2) 145-169 points satisfactory (3) 170-194 points good (4) 195-240 points excellent (5)

Recommended literature (copies available at the copying room of the Department K261):

A.J. Francis: Introducing structures pp. 1-28, pp221-259, pp278-285

Daniel L. Schodeck: Structures pp3-120, pp472-534

H.S. Howard: Structure, an architects′ approach, Mc Graw Hill Co. 1966 pp3-43, pp204-233, pp275-286

Information available on the homepage of the Department of Mechanics and Structures: www.szt.bme.hu/English courses/Fundamentals of Structures/2015:

-Topics schedule and requirements of the subject

-Lecture notes

-Solution of some selected problems