Laboratory Practice of Testing of Structures and Materials - BMEEOHSAS46

I. Subject Specification

1. Basic Data

1.1 Title

Laboratory Practice of Testing of Structures and Materials

1.2 Code

BMEEOHSAS46

1.3 Type

Module with associated contact hours

1.4 Contact hours

Type	Hours/week / (days)
Lab	1

1.5 Evaluation

Midterm grade

1.6 Credits

2

1.7 Coordinator

name	Dr. Horváth László István
academic rank	Associate professor
email	horvath.laszlo@emk.bme.hu

1.8 Department

Department of Structural Engineering

1.9 Website

https://epito.bme.hu/BMEEOHSAS46
https://fiek2.mywire.org/course/view.php?id=448

1.10 Language of instruction

hungarian and english

1.11 Curriculum requirements

Compulsory in the Civil Engineering (BSc) programme

1.12 Prerequisites

Strong prerequisites:

- Steel Structures (BMEEOHSAT42)
- Reinforced Concrete Structures (BMEEOHSAT43)

1.13 Effective date

1 September 2022

2. Objectives and learning outcomes

2.1 Objectives

The aim of the subject is to show up the structural element behaviour under various loading and support conditions by modelling and testing of members and details and to demonstrate the measuring process and the methods of the experimental stress analysis; to make familiar the students with modern construction materials and methods of testing. Within the scope of the subject the general and special diagnostic techniques of steel, concrete, composite, glass, masonry and timber structures will be shown.

2.2 Learning outcomes

Upon successful completion of this subject, the student:

A. Knowledge

1. Student knows the general terminology of the laboratory tests of structures and materials,
2. knows the basic behaviour and failure modes of the structural elements,
3. knows the main application areas and properties of the modern building materials,
4. knows the basic strength and stability phenomenon,
5. knows the most common diagnostic and error detection methods,
6. knows the basics of the measurement- and test methods.

B. Skills

1. Student is able to follow the loading process of the structures and structural members; and recognize the events,
2. is able to recognize the basic stability phenomenon,
3. is able to choose the best applicable measuring- and testing method,
4. is able to identify the most material- and structural diagnostic problems; to explore the necessary theoretical and practical background; and finally – based on the gained knowledge – to develop the method to solve it,
5. is able to regularly communicate in written or oral form.

C. Attitudes

1. The student makes an effort to get to know and daily use the tools needed for the problem solving,
2. the student makes an effort to accurate and error-free task solving,
3. the student makes an effort to put forward the principle of energy efficiency and environmental awareness.

D. Autonomy and Responsibility

1. Independently and responsible takes part on the laboratory tests,
2. uses the systematic approach in its thinkings.

2.3 Methods

Laboratory experiments, written and oral communication, use of IT tools and techniques.

2.4 Course outline

Week	**Topics of lectures and/or exercise classes**
1.	Non-destructive crack detection methods
2.	Lateral stability of the steel beam
3.	Behaviour of the compressed column
4.	Torsion and warping
5.	Behaviour of the prestressed concrete beam
6.	Thin-walled member
7.	Basics of structural dynamics
8.	General building diagnostic methods
9.	Thermodynamical and X-ray-diffraction inspection
10.	Glass in buildings
11.	Effect of different additives to the concrete properties
12.	High-strength fiber reinforced polymers
13.	Recycling of building materials
14.	Final summary

The above programme is tentative and subject to changes due to calendar variations and other reasons specific to the actual semester. Consult the effective detailed course schedule of the course on the subject website.

2.5 Study materials

1. Written lecture notes given by the lecturers
2. Electronic Lecture Notes from the webpage of the subject

2.6 Other information

1. Attendance to laboratory practices is compulsory. The signature and credits from the subject will be refused to students attending less than 70% of the classes.
2. Working clothes for the practices cannot be provided by the department.
3. It is compulsory for all students to know and comply the Laboratory Health and Safety Instructions, which may be found on the homepage of the subject.
4. There is no possibility for retake or repetition of any laboratory practice.

2.7 Consultation

The instructors are available for consultation during their office hours, as advertised on the department website. Special appointments can be requested via e-mail.

This Subject Datasheet is valid for:

2023/2024 semester I

II. Subject requirements

Assessment and evaluation of the learning outcomes

3.1 General rules

The assessment of the learning outcomes specified in clause 2.2. above and the evaluation of student performance occurs via final midterm test.

3.2 Assessment methods

Evaluation form	Abbreviation	Assessed learning outcomes
midterm test	ZH	A.1-A.6; B.1-B.5; C.1-C.3; D.1-D.2

The dates of deadlines of assignments/homework can be found in the detailed course schedule on the subject's website.

3.3 Evaluation system

Abbreviation	Score
ZH	100%
Sum	**100%**

The midterm test is only successful if minimum 50% of the available points were collected.

3.4 Requirements and validity of signature

No signature can be obtained from the subject.

3.5 Grading system

Grade	Points (P)
excellent (5)	80% <= P
good (4)	70% <= P < 80%
satisfactory (3)	60% <= P < 70%
passed (2)	50% <= P < 60%
failed (1)	P < 50%

3.6 Retake and repeat

1. The retake or the repeat of the midterm tests overwrite the original results.
2. In case the Student cannot have valid midterm test using the retake during the semester time they may take part on extra retake in the repetition period with paying the extra charge.

3.7 Estimated workload

Activity	Hours/semester
contact hours	12×4=48
preparation for the tests	12

Sum	**60**

3.8 Effective date

1 September 2022

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