Field Course of Structural Geodesy - BMEEOAFAS42

I. Subject Specification

1. Basic Data

1.1 Title

Field Course of Structural Geodesy

1.2 Code

BMEEOAFAS42

1.3 Type

Module with associated contact hours

1.4 Contact hours

Type	Hours/week / (days)
Field course	(24)

1.5 Evaluation

Midterm grade

1.6 Credits

1

1.7 Coordinator

name	Tamás Tuchband PhD
academic rank	Research fellow
email	tuchband.tamas@emk.bme.hu

1.8 Department

Department of Geodesy and Surveying

1.9 Website

https://epito.bme.hu/BMEEOAFAS42
https://fiek2.mywire.org/course/view.php?id=419

1.10 Language of instruction

hungarian and english

1.11 Curriculum requirements

Compulsory in the Specialization in Structural Engineering (BSc) programme

1.12 Prerequisites

Strong prerequisites:

- Surveying Field Course (BMEEOAFAT43)
- Building Construction Study (BMEEOEMAT44)

1.13 Effective date

5 February 2020

2. Objectives and learning outcomes

2.1 Objectives

In the course, students will get know the modern methods and instruments of state and movement studies of civil engineering structures.The senior student uses the basic knowledge learned in previous surveying subjects within a complex civil engineering task. Solving these tasks, the student recognizes the relationship and context between surveying and other subjects.

2.2 Learning outcomes

Upon successful completion of this subject, the student:

A. Knowledge

1. Understand the possible deformations of the building elements and the correlations of surveyingmethods for determining them,
2. Understand why and how surveying services are needed for indoor assessment of buildings,
3. Understands the principle, advantages and disadvantages of the measurement methods applied to the motion of bridges, its typical application possibilities,
4. Knows the surveying methods needed to determine the geometric dimensions and shape of civil engineering facilities
5. Knows about the application of photogrammetry and laser scanning technologies in structural engineering.

B. Skills

1. Able to apply engineering leveling to determine the geomorphic state of building elements such as floor and ceiling,
2. Able to handle precise optical levels,
3. Able to compute and document deflections from current precise line leveling and former heights,
4. Able to use electronic distance meters and measuring tapes to create floor plans and to transform them into local and national networks,
5. Able to measure the deflections caused by bridge traffic using RTK GNSS technique, robotic total station, and additional methods suitable for the task with instructor help,
6. Able to align circles, straight lines, and surfaces on points measured with total station with instructor help as well as analyzes and evaluates the remaining residuals of the process.

C. Attitudes

1. Attempts to perform surveying measurements with the suitable accuracy of the task,
2. Recognizes the importance of controlling the measurements and also carry them out,
3. Considers it important that the results of the measurements and calculations be given with precision consistent with the accuracy of the data.

D. Autonomy and Responsibility

1. Openly receives the well-founded critical comments,
2. In some situations - as part of a team - collaborates with other students in solving tasks,
3. Individually makes expertise and documents of the evaluation of the measurements.

2.3 Methods

After a short introduction, students are able to solve the measurement tasks in a small group, then the processing of certain measurements, the evaluation and documentation of the results are carried out within the framework of homework.

2.4 Course outline

Week	**Topics of lectures and/or exercise classes**
1.	Building deformation analysis
2.	Internal survey of a building
3.	Photogrammetry and Laser Scanning Structural Engineering Applications
4.	Settlement monitoring of a building
5.	Determination the verticality of a high structure (chimney)
6.	Bridge motion analysis with GNSS technology and robotic total station

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

Tasks and online tutorials to prepare for exercises in the educational framework

2.6 Other information

1. The subject is taught during the semester by 6x4 hours.
2. Some of the measurements are carried out outdoors, regardless of the weather.
3. Participation in the exercises is compulsory. Replacement, repeat for a student is allowed once in one semester, agreed with the professor.
4. If, for a task to be solved individually, the student hands in the work of his / her partner and it can be proven, the grade for that assignment is automatically failed and cannot be corrected.
5. Part of the homework can be done in group work.

2.7 Consultation

Appointments: As specified on the department’s website, or in consultation with the course instructors via e-mail

Field Course of Structural Geodesy - BMEEOAFAS42

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 2.22.2 above and the evaluation of student performance occurs via the student's activity during the course and the three home-works.To repeat and systematize the knowledge and skills acquired during the prestudies, we provide a sufficient number of training tasks in the educational framework.

3.2 Assessment methods

Evaluation form	Abbreviation	Assessed learning outcomes
1. Homework	HW1	A.1; B.1; C.3; D.2-D.3
2. Homework	HW2	A.2; B.4; C.3; D.1-D.2
3. Homework	HW3	B.3; C.3; D.2
4. Activity	A	A.3-A.5; B.1-B.6; C.1-C.2; D.1

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
HW1	30%
HW2	30%
HW3	30%
A	10%
Totally	**100%**

3.4 Requirements and validity of signature

Signature could not be obtained from the subject.

3.5 Grading system

The condition for obtaining the grade is the full participation in the exercises and perform all the tasks listed in point 3.3 at least at a satisfactory level.The final grade is the average value of the result of the tasks weighted according to the 3.3 point.

3.6 Retake and repeat

1. The deadline for submitting the homework is 2 weeks from the date of issue.
2. Homework - after the payment of the fee determined in the regulation - can be submit with delay until 16.00 or in electronic format until 23.59 of the last day of the completion week.
3. The submitted and accepted homework can be corrected without any fee until the deadline described in the point 2.

3.7 Estimated workload

Activity	Hours/semester
contact hours	6×4=24
preparation for the practise	1

preparation for the homework	5
Sum	**30**

3.8 Effective date

5 February 2020

This Subject Datasheet is valid for:

2023/2024 semester I