

## I. Subject Specification

### 1. Basic Data

#### 1.1 Title

Surveying

#### 1.2 Code

BMEEOAFS701

#### 1.3 Type

Module with associated contact hours

#### 1.4 Contact hours

| Type    | Hours/week /<br>(days) |
|---------|------------------------|
| Lecture | 2                      |

#### 1.5 Evaluation

Midterm grade

#### 1.6 Credits

2

#### 1.7 Coordinator

|               |  |
|---------------|--|
| name          | Dr. Takács Bence   |
| academic rank | Associate professor  |
| email         | <a href="mailto:takacs.bence@emk.bme.hu">takacs.bence@emk.bme.hu</a> |

#### 1.8 Department

Department of Geodesy and Surveying

#### 1.9 Website

<https://epito.bme.hu/BMEEOAFS701>

<https://edu.epito.bme.hu/course/view.php?id=3379>

#### 1.10 Language of instruction

hungarian and english

1.11 Curriculum requirements

Offered in non-civil engineering program

1.12 Prerequisites

1.13 Effective date

5 February 2020

## 2. Objectives and learning outcomes

### 2.1 Objectives

The main purpose of this course is to present the most important services and products of land surveying offered to architects especially in the field of planning, constructions, facility management and building control authority processes. The course demonstrates the main principles of positioning used in land surveying up to the required level. In addition to the classical methods, modern techniques and instruments are also introduced, such as [total stations](#), robot [total stations](#), global positioning techniques, laser scanning as well as photogrammetry. Several examples and documentation from the practice are demonstrated to make the course material more understandable.

### 2.2 Learning outcomes

Upon successful completion of this subject, the student:

#### A. Knowledge

1. knows the reference systems applied in land surveying,
2. understands the relation between reference systems and networks of control points,
3. knows the principle of the most important positioning techniques,
4. knows the most modern instruments and techniques such as [total stations](#), robot [total stations](#), global positioning techniques, laser scanning as well as photogrammetry,
5. knows the requirements of digital maps,
6. has an overview of the relation between architectural plans and setting out plans,
7. understands the essence of profile boards,
8. knows the geodetic techniques necessary to build large reinforced concrete buildings,
9. knows the features of movement detection techniques using land surveying methods,
10. knows the documentation of a moving detection project,
11. has an overview of the main tasks of quality control carried out by land surveyors,
12. has an overview of the land registry system in Hungary especially its application in architecture,
13. has an overview of the techniques to survey buildings.

#### B. Skills

1. is able to compute the volume of simple excavation work,
2. can determine those tasks which can be completed by land surveying techniques and is able to set up the most important requirements of them.

#### C. Attitudes

1. attempts to cooperate with other engineers, like land surveyors,
2. is open to the methods of other engineers, like land surveyors,
3. aims to express their thoughts straightforward, prefers using figures.

**D. Autonomy and Responsibility**

1. studies the course material mainly alone, have a consultation with the lecturer if it is needed.

**2.3 Methods**

Lectures, a few short demonstrations of instruments, introductions of several examples from the engineering practice.

**2.4 Course outline**

| <b>Week</b> | <b>Topics of lectures and/or exercise classes</b>  |
|-------------|--|
| 1.          | Introduction. Map projections. Horizontal and vertical control points. Geodetic networks.  |
| 2.          | Methods of horizontal measurements.  |
| 3.          | Methods of vertical measurements.  |
| 4.          | Tacheometry.   |
| 5.          | Detail surveys.  |
| 6.          | Recent techniques and instruments: GPS positioning. Laser scanning. Aerial photogrammetry. |
| 7.          | Large scale maps and plans.  |
| 8.          | Digital terrain models.  |
| 9.          | Volume computation.  |
| 10.         | Horizontal and vertical setting out.   |
| 11.         | Geometrical control of constructions.  |
| 12.         | Movement detection.  |
| 13.         | Cadastral surveying.   |
| 14.         | Surveying of buildings.  |

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**

on-line materials available in the homepage of the subject

**2.6 Other information****2.7 Consultation**

Appointments: as specified on the department's website, or in consultation with the course instructors via e-mail.

Inactive courses

**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 two midterm tests.

## 3.2 Assessment methods

| <b>Evaluation form</b> | <b>Abbreviation</b> | <b>Assessed learning outcomes</b> |
|------------------------|---------------------|-----------------------------------|
| 1. midterm test        | MT1                 | A.1-A.5; B.2; C.1-C.3; D.1        |
| 2. midterm test        | MT2                 | A.6-A.13; B.1-B.2; C.1-C.3; 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

| <b>Abbreviation</b> | <b>Score</b> |
|---------------------|--------------|
| MT1                 | 50%          |
| MT2                 | 50%          |
| <b>Sum</b>          | <b>100%</b>  |

## 3.4 Requirements and validity of signature

There is no signature from the subject.

## 3.5 Grading system

1. evaluation is done using a grade from 1 to 5,
2. both midterm tests need to be completed at least with satisfactory results (2<=),
3. the final grade is calculated as the average of the two midterm tests.

## 3.6 Retake and repeat

1. Students who failed one of the two written tests or didn't manage to attend one of them, need to have an oral retake during the resubmission period.
2. Only one of the two written tests can be retaken.
3. If someone would like to get a higher grade, they need to have an oral retake during the resubmission period.

## 3.7 Estimated workload

| <b>Activity</b> | <b>Hours/semester</b> |
|-----------------|-----------------------|
|                 |                       |

## Surveying - BMEEOAFS701

|                                |                    |
|--------------------------------|--------------------|
| contact hours                  | $12 \times 3 = 28$ |
| preparation for the assessment | $2 \times 16 = 32$ |
| <b>Sum</b>                     | <b>60</b>          |

3.8 Effective date

5 February 2020

This Subject Datasheet is valid for:

Inactive courses