SUBJECT DATASHEET

I. SUBJECT SPECIFICATION

1 BASIC DATA

1.1 Title

Basic Surveying

1.2 Code

BMEEOAFPRE4

1.3 Type

Module with contact hours

1.4 Contact hours

type	hours/week
practical	4

1.5 Evaluation

midterm grade

1.6 Credits

0

1.7 Coordinator

name:	Dr. Szabolcs Rózsa
academic rank:	associate professor
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1.8 Department

Department of Geodesy and Surveying (http://geod.bme.hu)

1.9 Website

http://geod.bme.hu/BMEEOAFPRE4?language=en

1.10 Language of instruction

English

1.11 Curriculum requirements

Compulsory in the Civil Engineering (Pre-engineering) programme.

1.12 Prerequisites

None

1.13 Effective date

4 February 2019.

2 OBJECTIVES AND LEARNING OUTCOMES

2.1 Objectives

The objective of the course is to give a solid basis for the BSc surveying courses present in the Civil Engineering programme. This includes a general overview of the fundamental measurements and their units used in engineering surveying; the basic structures and identities concerning geometry, trigonometry and coordinate geometry; the fundamentals of mapping, map reading and surveying drafts; basic knowledge about geometrical optics and telescopes; essential theories concerning the Earth's gravity field and the fundamentals of dynamics and circular motion.

2.2 Learning outcomes

Upon successful completion of this subject, the student:

A. Knowledge
   1. knows the basic measurements types and units used in engineering surveying,
   2. has a fundamental understanding of practical geometric, trigonometric and coordinate geometric theories and identities,
   3. understands the concept of mapping, the fundamentals of reading a map or survey and the overview of solving surveying problems by drafting,
   4. knows the fundamentals of geometric optics and the basic workings of surveying telescopes,
   5. knows the basic theory of carrying out measurements with an engineer's level
   6. knows the fundamental theories concerning the Earth's gravity field and how they can be used in practice,
   7. has an overview of the physics of circular motion and the effect of the Earth's rotation in geodetic calculations.

B. Skills
   1. can solve practical geometric, trigonometric and coordinate geometric problems,
   2. can use the fundamentals of mapping and drafting to solve basic surveying problems,
   3. can apply the theories of geometrical optics to determine various properties of the surveying telescope's imaging,
   4. can take readings with an engineer's level and do basic calculations with the measurement data,
   5. can solve problems concerning Newton's law of universal gravitation and centrifugal forces,
   6. can use the basic theories of dynamics to solve practical problems connected to circular motion.

C. Attitudes
   1. follows the fundamental steps of practical problem solving presented by the instructor,
   2. aims to compute results in a precise and unambiguous way,
   3. actively prepares for the classes by revising the study material.

D. Autonomy and responsibility
   1. is prepared to work alone or in a group if necessary,
   2. is responsible to clear up any misunderstanding concerning the study material with the instructor,
   3. is intent on applying a systematic approach to solving surveying problems
   4. is prepared to recognize and correct errors.

2.3 Methods

Lectures and solving relevant computational exercises during the lessons with the guidance of the instructor and the supplied online study material.

2.4 *Course outline*

Week	Topics of lectures and/or exercise classes
1.	Introduction, measurement units, angles
2.	Basics of geometrical calculations I.
3.	Basics of geometrical calculations II.
4.	Trigonometrical computations
5.	Coordinate geometry I.
6.	Coordinate geometry II.
7.	Basics of mapping, reading a map
8.	Contour lines and surveying drafts
9.	Engineering levelling I.
10.	Engineering levelling II.
11.	Geometrical optics
12.	Gravitation and heights
13.	The Earth's gravity field
14.	Circular motion, dynamics

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*

a) Textbooks

1. Nathan Altshiller-Court – College Geometry (recommended)
2. Michael Sullivan – Algebra & Trigonometry (9th edition) (recommended)
3. Jearl Walker, David Halliday, Robert Resnick – Fundamentals of Physics (10th edition) (recommended)

b) Online materials

1. Lecture notes (https://edu.epito.bme.hu/local/coursepublicity/public-courses.php?publicityid=1904)

2.6 *Other information*

1) Attendance to lectures is compulsory. The signature and credits from the subject will be refused to students missing more than 30% of the classes.
2) Students are evaluated based on their actual individual performance. Students are required to show evidence of their own knowledge and skills. Submitting a work of others, obtaining or giving unauthorized help (e.g. during an exam or test) cheating and plagiarism in any form is unacceptable. Whoever violates the respective Regulations of the University will be given a failing grade (1), without the possibility of retake and repeat, and will be reported to the Dean's Office

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: laky.piroska@epito.bme.hu and ambrus.bence@epito.bme.hu.

II. SUBJECT REQUIREMENTS

1 ASSESSEMENT AND EVALUATION OF THE LEARNING OUTCOMES

2.8 General rules

The assessment of the learning outcomes specified in clause 2.2. above is based on

- four control tests of which the three with the highest scores are taken into account at the end of the semester,
- two homework assignments.

The control tests are not compulsory but they cannot be repeated. The available time for solving the tests is 45 minutes.

The homework assignments are graded with a pass/fail mark. If the student receives a fail mark, the homework is given back for correction and can be resubmitted once until the end of the semester.

2.9 Assessment methods

Evaluation form	abbrev.	**assessed learning outcomes**
1. control test	CT1	A.1-A.2; B.1; C.1-C.3
2. control test	CT2	A.2; B.2; C.1-C.3
3. control test	CT3	A.3-A.4; B.3; C.1-C.3
4. control test	CT4	A.4-A.7; B.4-B.6; C.1-C.3
1. homework assignment	HW1	A.3; B.2; C.2-C.3; D.1-D.4
2. homework assignment	HW2	A.3; B.2; C.2-C.3; D.1-D.4

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

2.10 Evaluation system

abbreviation	**points**	**score**
CT1	20	33,3%
CT2	20	33,3%
CT3	20	33,3%
CT4	20	33,3%
HW1	pass/fail	0%
HW2	pass/fail	0%
Total achievable during the semester	**60**	**100%**
Sum	**60**	**100%**

There is no minimum point threshold for any of the control tests. As only the three with the highest scores are taken into account at the end, the sum of the individual scores in the table of above is not equal to 100%.

In order to pass the subject, the student has to achieve at least 50% of the total achievable points (30 points) and have a pass mark for both homework assignments.

2.11 Requirements and validity of signature

There is no signature from the subject.

2.12 Grading system

The subject is successfully accomplished if:

- the total number of points from the three control tests with the highest scores is at least 50% percent of the total achievable points (i.e. 30 points),
- both homework assignments received a pass mark.

grade	**points (P)**	
excellent (5)	$48 \leq P$	$(80\% \leq P)$
good (4)	$42 \leq P < 48$	$(70\% \leq P < 80\%)$
satisfactory (3)	$36 \leq P < 42$	$(60\% \leq P < 70\%)$
passed (2)	$30 \leq P < 36$	$(50\% \leq P < 60\%)$
failed (1)	$P < 30$	$(P < 50\%)$

2.13 Retake and repeat

1) As the control tests are not compulsory, they cannot be retaken. The three best (with the highest scores) are taken into account when determining the grade.
2) Submitted homework assignments that receive a fail mark are given back for correction. Each of the homework assignments can be resubmitted once until the end of the semester.

2.14 Estimated workload

activity	**hours/semester**
contact hours	14×4=56
preparation for the courses	14×2=28
preparation for the tests	4×5=20
homework	6
home studying of the written material	10
in total	**120**

2.15 Effective date

4 February 2019.