Basic Surveying - BMEEOAFPRE4

I. Subject Specification

1. Basic Data

1.1 Title

Basic Surveying

1.2 Code

BMEEOAFPRE4

1.3 Type

Module with associated contact hours

1.4 Contact hours

Type	Hours/week / (days)
Lecture	4

1.5 Evaluation

Midterm grade

1.6 Credits

0

1.7 Coordinator

name	Dr. Szabolcs Rózsa
academic rank	Associate professor
email	rozsa.szabolcs@emk.bme.hu

1.8 Department

Department of Geodesy and Surveying

1.9 Website

https://epito.bme.hu/BMEEOAFPRE4
https://fiek2.mywire.org/course/view.php?id=1904

1.10 Language of instruction

english

1.11 Curriculum requirements

Compulsory in Civil Engineering (Pre-engineering) programme

1.12 Prerequisites

1.13 Effective date

5 February 2020

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, reading maps 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 a surveyor'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 surveyor'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.	Trigonometrical computations
3.	Trigonometrical height determination with instruments
4.	Coordinate geometry, Cartesian and polar coordinates systems
5.	Intersections
6.	Area computations
7.	Engineering levelling
8.	Detailed point measurements with levelling instrument
9.	Contour lines and surveying drafts
10.	Electromagnetic waves, prisms
11.	Geometrical optics
12.	Circular motion, dynamics
13.	The Earth's gravity field
14.	Gravitation and heights

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 sending an e-mail to the lecturers.

This Subject Datasheet is valid for:

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 is based on

- 2 control tests,
- 1 homework assignments.

One of the control tests can be repeated, if necessary. The available time for solving the tests is 90 minutes.

3.2 Assessment methods

Evaluation form	Abbreviation	Assessed learning outcomes
1. control test	CT1	A.1-A.3; B.1-B.2; C.1-C.3
2. control test	CT2	A.4, A.6-A.7; B.3, B.5-B.6;C.1-C.3
homework assignment	HW	A.4-A.5; B.4; C.1-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.
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3.3 Evaluation system

Abbreviation	Point	Score
CT1	20	33.3%
CT2	20	33.3%
HW	20	33.3%
Total achievable during the semester	60	100%
Sum	**60**	**100%**

There is no minimum point threshold for any of the control tests or homework. In order to pass the subject, the student has to achieve at least 50% of the total achievable points (30 points).

3.4 Requirements and validity of signature

There is no signature from the subject.

3.5 Grading system

The subject is successfully accomplished if:

- the total number of points from the two control tests and the homework is at least 50% percent of the total achievable points (i.e. 30 points)

Grade	Points (P)
excellent (5)	48 ≤ P(80% ≤ P)
good (4)	42 ≤ P< 48(70%≤ P < 80%)
satisfactory (3)	36 ≤ P < 42(60% ≤ P < 70%)
passed (2)	30 ≤ P < 36(50% ≤ P < 60%)
failed (1)	P < 30(P < 50%)

3.6 Retake and repeat

1. The control tests and homework are not compulsory, but 50% has to be achieved from the total points. One of the 2 tests can be retaken, if necessary.

3.7 Estimated workload

Activity	**Hours/semester**
contact hours	14×4=56
preparation for the courses	14×1=14
preparation for the tests	2×15=30
homework	10
home studying of the written material	10
Sum	**120**

3.8 Effective date

1 September 2020

This Subject Datasheet is valid for:

Inactive courses