Earthworks of Infrastructures - BMEEOGMMG-4

I. Subject Specification

1. Basic Data

1.1 Title

Earthworks of Infrastructures

1.2 Code

BMEEOGMMG-4

1.3 Type

Module with associated contact hours

1.4 Contact hours

Type	Hours/week / (days)
Lecture	2
Seminar	1

1.5 Evaluation

Midterm grade

1.6 Credits

4

1.7 Coordinator

name	Attila Takács Ph.D.
academic rank	Assistant professor
email	takacs.attila@emk.bme.hu

1.8 Department

Department of Engineering Geology and Geotechnics

1.9 Website

https://epito.bme.hu/BMEEOGMMG-4
https://fiek2.mywire.org/course/view.php?id=2070

1.10 Language of instruction

hungarian and english

1.11 Curriculum requirements

Compulsory in the Specialization in Geotechnics and Geology, Strcutural Engineering (MSc) programme

Optional in the Structural Engineering (MSc) programme

1.12 Prerequisites

1.13 Effective date

1 September 2021

2. Objectives and learning outcomes

2.1 Objectives

The aim of the course is that the students understand the geotechnical aspects of infrastructures' earthworks. In this course the student gets to know the effect of earthquakes on subsoil and earthworks (damages, stability calculation, liquefaction, case studies, failures), the concepts of embankment construction on soft soils (primary consolidation, secondary compression, wick drains, vibroflotation, dynamic compaction, dynamic replacement, staged construction), design, construction and control of soil and rock dams and flood protection dikes, and calculation of quick condition and sandpiping.

2.2 Learning outcomes

Upon successful completion of this subject, the student:

A. Knowledge

1. knows the special geotechnical aspects of infrastructure earthwork construction,
2. knows the problems related earthwork construction on soft soils,
3. knows the techniques of soil improvement,
4. knows the special geotechnical aspects of design, construction and monitoring of flood protection dikes.

B. Skills

1. is able to recognize the geotechnical problems related to an infrastructure project,
2. is able to design soil improvement,
3. is able to design earthworks related to water infrastructures,
4. is able to design earthworks considering seismic actions.

C. Attitudes

1. cooperates with the lecturer during learning,
2. expands her/his knowledge by continuous learning,
3. is open to use new tools of information technology,
4. tries for getting know and using the up-to-date tools in geotechnical engineering,
5. tries for accurate and errorless problem solving.

D. Autonomy and Responsibility

1. is able to individually solve geotechnical problems and find solutions to tasks based on the information

made available,
2. is open to well-founded criticism,
3. is able to work as part of a group, together with their classmates, on the solutions for various problems,
4. applies system approach in their thinking.

2.3 Methods

Lectures, calculation examples during lectures, written communication, application of IT devices and techniques, tasks performed independently.

2.4 Course outline

Week	**Topics of lectures and/or exercise classes**
1.	Soil exploration, ground investigation methods.
2.	Special characteristics of organic soils.
3.	Design and construction of embankment on soft soils.
4.	Soil improvement methods.
5.	Design of soil improvement.
6.	Earthworks for water infrastructures.
7.	Design considerations in case of earth and rock dams.
8.	Design of flood protection dikes.
9.	Construction and monitoring of flood protection dikes.
10.	Mobile flood protection walls.
11.	Flood phenomenon.
12.	Examination of slope stability.
13.	Use of softwares for examination of slope stability.
14.	Summary, overview.

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

Online materials, lecture presentations.

2.6 Other information

The Lectures on the English language course are held by Gábor Nagy Ph.D. (nagy.gabor@emk.bme.hu) and István Kádár Ph.d. (kadar.istvan@emk.bme.hu)

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: nagy.gabor@emk.bme.hu, kadar.istvan@emk.bme.hu

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 and the evaluation of student performance occurs via 2 midterm tests and 2 homework assignments.

3.2 Assessment methods

Evaluation form	Abbreviation	Assessed learning outcomes
1. midterm test	MT1	A.1-A.4; B.1-B.4
2. midterm test	MT2	A.1-A.4; B.1-B.4
1. homework	HW1	A.1-A.4; B.1-B.4; C.1-C.5; D.1-D.4
2. homework	HW2	A.1-A.4; B.1-B.4; C.1-C.5; D.1-D.4

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
MT1	25%
MT2	25%
midterm activities together	50%
HW1	25%
HW2	25%
homeworks together	50%
Sum	**100%**

3.4 Requirements and validity of signature

There is no signature for this subject.

3.5 Grading system

Grade	Points (P)
excellent (5)	85%<=P
good (4)	70<=P<85%
satisfactory (3)	60<=P<70%
passed (2)	50<=P<60%
failed (1)	P<50%

3.6 Retake and repeat

The two midterm tests can be retaken free of charge once. In case of failing a retake described in the point 3. there is a possibility for a second retake – after the payment of the fee determined in the regulation – in the supplementary period. Only one midterm test may be retaken twice.

3.7 Estimated workload

Activity	Hours/semester

contact hours	14×3=42
preparation for the courses	14×1=14
preparation for the midterm tests	2×16=32
homework	2×16=32
Sum	**120**

3.8 Effective date

1 September 2021

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Inactive courses