Geotechnical design - BMEEOGMMG-3

I. Subject Specification

1. Basic Data

1.1 Title

Geotechnical design

1.2 Code

BMEEOGMMG-3

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	Dr. Szendefy János
academic rank	Assistant professor
email	szendefy.janos@emk.bme.hu

1.8 Department

Department of Engineering Geology and Geotechnics

1.9 Website

https://epito.bme.hu/BMEEOGMMG-3
https://fiek2.mywire.org/course/view.php?id=2069

1.10 Language of instruction

hungarian and english

1.11 Curriculum requirements

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

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

1.12 Prerequisites

1.13 Effective date

1 September 2017

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2. Objectives and learning outcomes

2.1 Objectives

The scope of the subject is to teach the students the necessary knowledges to geotechnical design, design approaches of EC7, geotechnical content of the constructions and infrastructure plans, details of soilmechanics drillings and sampling, laboratory tests and sounding procedures. Optimalization the geotechnical design of big investments. Design details of soilnailings and anchors. Design procedure of jet-groutings, bedding layers and its QC. Designing with observation method and details of monitoring systems.

2.2 Learning outcomes

Upon successful completion of this subject, the student:

A. Knowledge

1. know the standards of Geotechnical design
2. know the methods of soil drillings, samplings and the relevant laboratory tests
3. know the methods of soundings and their analyses
4. know the design of soilnailing and anchors
5. know the deign of bedding layers and their QC
6. know the design of jet-grouting
7. know the design of monitoring systems

B. Skills

1. is able to recognize the geotechnical problems
2. is able to classify the problems to geotechnical categories
3. is able to determine the requirements of the geotechnical plans
4. is able to determine the necessary types, numbers and depth of geotechnical ground investigation
5. is able to determine the soil parameters based on drillings, laboratory tests and soundings
6. is able to design soilnailings and anchors
7. is able to define the thickness, types of the material and the QC of the bedding materials,
8. is able to design jet-grouting
9. is able to design monitoring systems, and using observation method

C. Attitudes

1. is cooperative with the teacher in gaining new knowledge,
2. is continuously expanding his/her knowledge through learning,
3. seeks to learn and routinely employ the design framework for geotechnical problem solving
4. strives for accurate task solving

D. Autonomy and Responsibility

1. individually assesses geotechnical problems and tasks, as well as their solution based on given sources
2. is open to reasoned critical remarks
3. applies a systematic way of thinking

2.3 Methods

Lectures, practical classes, verbal and written communication

2.4 Course outline

Hét	**Előadások és gyakorlatok témaköre**
1.	Short intorduction of the course. The geotechnical part of the designing. Codes, the nominations, connections, the geotechnical codes. References of codes.
2.	The contents of the geotechnical codes. Details of MSZ EN 1997-1:2006 and MSZ EN 1997-2:2006. Ground investigation, site exploration and sampling. Classification of the sampling quality (MSZ EN 1997-2:2006). Analyses of laboratory test result for geotechnical design. Groundwater sampling and groundwater chemical analyses.
3.	Sounding procedures. Analasys of sounding results. Determination of geotechnical paramteres from sounding results. Geotechnical design based on sounding results.
4.	Geotechnical optimalization of foundation and retaining strustures in large-scale investments.
5.	Design and technology of shotcrete walls and reinforced soil retaining walls.
6.	Homework: design a shotcrete wall or a reinforced soil retaining structure.
7.	Design and technology of anchors of retaining structures.
8.	Design and quality control of bedding and capping layers.
9.	Risk analyses of soil liquifaction. Design and technology of soilimprovement for liquifaction.
10.	Design and technology of Jet-grouting.
11.	Geotechnical monitoring systems. Observation method design procedure.
12.	Homework: Desing a monitoring system for a project.
13.	Geotechnial casestudies.
14.	Short intorduction of the course. The geotechnical part of the designing. Codes, the nominations, connections, the geotechnical codes. References of codes.

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) Online materials:

1. Lecture ppt-s

b) Other books:

1. R Frank at all Designer's guide to EN1997-1

2.6 Other information

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: szendefy.janos@epito.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 midterm tests.

3.2 Assessment methods

Teljesítményértékelés neve (típus)	Jele	Értékelt tanulási eredmények
1. midterm test	ZH1	A.1-A.7; B.1-B.10
1. project	HF1	A.5; B.6; C.1-C.4; D.1-D.3
2. project	HF2	A.7; B.9; C.1-C.4; D.1-D.3

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

3.3 Evaluation system

Jele	Részarány
ZH1	60%
HF1	20%
HF2	20%
Összesen	**100%**

3.4 Requirements and validity of signature

The midterm tests are failed if the sum points of the tests is less than the 50% of the obtainable points.

3.5 Grading system

Érdemjegy	Pontszám (P)
jeles (5)	86<=P
jó (4)	74<=P<86%
közepes (3)	62<=P<74%
elégséges (2)	50<=P<62%
elégtelen (1)	P<50%

3.6 Retake and repeat

The midterm tests can be retaken free of charge. In case of failing the retake described in the point 3. there is a possibility for second retake – after the payment of the fee determinated in the regulation – in the supplementary period.

3.7 Estimated workload

Tevékenység	Óra/félév
contact hours	14×4=56
preparation for the courses	14×2=28
preparation for the tests	2×10=20
projects	6

home studying of the written material	10
Összesen	**120**

3.8 Effective date

1 September 2017

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Inactive courses