Geology - BMEEOGMAT41

I. Subject Specification

1. Basic Data

1.1 Title

Geology

1.2 Code

BMEEOGMAT41

1.3 Type

Module with associated contact hours

1.4 Contact hours

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

1.5 Evaluation

Exam

1.6 Credits

3

1.7 Coordinator

name	Dr. Ákos Török
academic rank	Professor
email	torok.akos@emk.bme.hu

1.8 Department

Department of Engineering Geology and Geotechnics

1.9 Website

www.epito.bme.hu/BMEEOGMAT41
https://fiek2.mywire.org/course/view.php?id=434

1.10 Language of instruction

hungarian and english

1.11 Curriculum requirements

Compulsory in the Civil Engineering (BSc) programme

1.12 Prerequisites

1.13 Effective date

1 September 2022

2. Objectives and learning outcomes

2.1 Objectives

The aim of the subject is that the students improve their knowledge focused on geological information for engineering purposes, especially for civil-engineering design, construction and research. The subject presents geological factors that determine the choice of the location of engineering facilities and the design and required maintenance of structures.
The gained geological knowledge will include the structure and dynamics of Earth, building materials of earth's crust, mineralogy; rock properties, volcanic, sedimentary and metamorphic rocks. Events affecting the ground, analysis of the influence of earthquakes and volcanism, and characterization of the surface movements, surface waters and groundwater are of priority importance. The subject also refers to environmental geology and interaction between structure and surrounding rock mass. The course inducates the development of scientific reasoning of engineering students and it establishes a link between engineering and natural sciences.

2.2 Learning outcomes

Upon successful completion of this subject, the student:

A. Knowledge

1. Knows the internal structure of Earth and the geological time scale
2. Knows the terminology of the mineral and the rock,
3. Knows the ingenious rock,
4. Knows the sedimentary and the metamorphic rocks,
5. Knows the terminology of the structural geology,
6. Knows the geological map and the properties of the sections,
7. Knows the surface forming processes,
8. Knows the system of the surface waters and the groundwaters,
9. Knows the basic filed and laboratory tests,

B. Skills

1. Able to identify rock types,
2. Able to understand geological maps, and create geological cross-section
3. Able to carry out in situ rock diagnostic, and write experts reports,
4. Able to express her/his thoughts orderly in written and oral.

C. Attitudes

1. cooperate with the teacher during the learning process,
2. improve her/his knowledge with continuous learning,
3. open to use the up-to-date software and design methods,
4. pursue to know and use of the toolkit that is necessary for the geotechnical and engineering geological

problem solution,
5. pursue to the exact and errorless task solution.

D. Autonomy and Responsibility

1. individually assesses geological problems and tasks associated with structural engineering,
2. their solution based on given sources
3. take into consideration the logical steps of the solution of engineering geological tasks,
4. open to reasoned critical remarks,
5. applies a systematic way of thinking

2.3 Methods

Lectures, mineral-rock recognise practise, geological mapping, verbal and written communication.

2.4 Course outline

Week	**Topics of lectures and/or exercise classes**
1.	Earth's history, the internal structure of Earth and continental drift. Building materials of the Earth' crust. The rock cycle.
2.	Requirements of the subject, Civil engineering aspects of geology, application area, engineering geology Rock-forming minerals.
3.	Igneous rocks, their characterization and usage, practice of igneous rock recognition
4.	Igneous rocks recognition, rock recognition test
5.	Sedimentary rocks, their characterization and usage
6.	Metamorphic rocks, their characterization and usage, practice for the rock recognition test
7.	Mineralogy and rock forming minerals: properties, types, recognition
8.	Metamorphic rocks recognition, rock recognition test
9.	Structural geology: faults, folds and geological structures
10.	Field trip to the Gellért-hill, structural geology, rock slope stabilization
11.	Processes acting on the Earth's surface: weathering, erosion, mass movements, landslides, earthquakes, volcanism
12.	Engineering geological tasks and problems; examples, case studies
13.	Surface waters (oceans, seas, lacustrine environments and rivers), Groundwater(types, karstic water, groundwater flow, springs, and water chemistry
14.	Geologic mapping

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. Török Á.: Geológia Mérnököknek, Műegyetemi Kiadó, 2008
2. Bell F.G. Fundamentals of Engineering Geology, Elsevier, 2016

b) Online materials:

1. 1. Lecture notes
2. Manual for the homework

2.6 Other information

1. The theoretical knowledge should be presented under practical trainings for students.
2. The minerals will be presented in Mineral and Rock Collection of ELTE (Eötvös Lorand University).
3. For the stone diagnostic home assignment, all students have to analyses a part of stone structure or a part of stone masonry structure on site.

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: torok.akos@epito.bme.hu

This Subject Datasheet is valid for:

2023/2024 semester I

II. Subject requirements

Assessment and evaluation of the learning outcomes

3.1 General rules

The assessment of the learning outcomes is specified in clause 2.2. above and the evaluation of the student's performance happens via 2 tests, 1 home assignment and the exam.

3.2 Assessment methods

Evaluation form	Abbreviation	Assessed learning outcomes
1. midterm test	MT1	A.1-A.4; B.1, B.4; C.1-C.2, C.4-C.5; D.1
2. midterm test	MT2	A.5-A.7; B.1-B.4; C.1-C.5; D.2
1. homework	HW	A.1-A.7; B.1-B.4; C.1-C.5; D.1-D.2
Written exam	E	A.1-A.9; B.1-B.4; C.4-C.5; D.1-D.5

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	30%
MT2	10%
HW	10%
Total achievable during the semester	**50%**
E	50%
Sum	**100%**

The final result is failed if on the exam minimum 50% of the points are not reached.

3.4 Requirements and validity of signature

The criterion of obtaining the signature is to reach half of the points achievable during the

semester according to clause 3.3.
To accomplish the practical part of the subject it is required to pass all tests and the home assignment separately.

The final result of the student who has the signature but instead applying for the examine course applies the practice again will be calculated from her/his better results.

The previously acquired signature is valid for 6 semesters for the calculation of the final result.

3.5 Grading system

The grade of those who accomplished the attendance is determined by the following criteria:
The midterm grade is coming from the result of the two midterm tests and the home assignment.
The final grade is computed as the weighted of the midterm requirements and the exam as described in 3.3.

Grade	Points (P)

excellent (5)	80<=P
good (4)	70<=P<80%
satisfactory (3)	60<=P<70%
passed (2)	50<=P<60%
failed (1)	P<50%

3.6 Retake and repeat

1) Homework – after the payment of the fee determined in the regulation – can be submitted with a delay until 16.00 or in electronic format until 23.59 of the last day of the completion week.
2) The submitted and accepted homework can be corrected without any fee until the deadline described in point 2.
3) The two midterm tests can be repeated once in the completion week free of charge.
In case of correction, the better result will be taken into account from the new and previous results.

3.7 Estimated workload

Activity	**Hours/semester**
contact hours	14×3=42

preparation for the courses	14×1=14
preparation for the tests	9+3=12
homework	6
home studying of the written material	16
Sum	**90**

3.8 Effective date

1 September 2022

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