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
lecture                 1
seminars/exercise classes 2

1.5 Evaluation
exam

1.6 Credits
3

1.7 Coordinators
name:                  Dr. Ákos Török
academic rank:        Professor
e-mail:               torok.akos@epito.bme.hu

1.8 Department
Department of Engineering Geology and Geotechnics (www.gmt.bme.hu)

1.9 Website
www.epito.bme.hu/BMEEOGMAT41

1.10 Language of instruction
Hungarian and/or English

1.11 Curriculum requirements
Compulsory in the in the Civil Engineering (BSc) programme

1.12 Prerequisites
-

1.13 Effective date
1st of September, 2020

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 indicates the development of scientific reasoning of engineering students and it establishes a link between engineering and natural sciences.

2.2 Learning outcomes

After successful completion of the course, the student will be able:

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. Attitude
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.
Course outline

Week Scope of lectures and practical 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 Course outline

a) Textbooks

1. Török Á.: Geológia Mérnőköknek, Műegyetemi Kiadó, 2008

b) Online materials

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 rock 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
II. SUBJECT REQUIREMENTS

3 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 tests, home assignment and exam.

3.2 Assessment methods

The dates of test and deadlines of homework can be found in the detailed course schedule on the subject’s website.

3.3 Evaluation system

<table>
<thead>
<tr>
<th>Evaluation form</th>
<th>abbrev.</th>
<th>assessed learning outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. midterm test</td>
<td>MT1</td>
<td>A.1-A.3, B.1; C1-C2, C4, D1</td>
</tr>
<tr>
<td>2. midterm test</td>
<td>MT2</td>
<td>A.1-A.4, B.1; B4, C1-C2, C4-C5, D1</td>
</tr>
<tr>
<td>1. homework</td>
<td>HW</td>
<td>A.1-A.7; B.1-B.4; C.1-C5; D.1-D.2,</td>
</tr>
<tr>
<td>Written/Oral exam</td>
<td>E</td>
<td>A.1-A.9; B.1-B.4; C.4-C5.; D1-D5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>abbreviation</th>
<th>score</th>
</tr>
</thead>
<tbody>
<tr>
<td>MT1</td>
<td>30%</td>
</tr>
<tr>
<td>MT2</td>
<td>10%</td>
</tr>
<tr>
<td>HW</td>
<td>10%</td>
</tr>
<tr>
<td>Total achievable during the semester</td>
<td>50%</td>
</tr>
<tr>
<td>E</td>
<td>50%</td>
</tr>
<tr>
<td>SUM</td>
<td>100%</td>
</tr>
</tbody>
</table>

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

3.4 Requirements and validity of signature

Criterion of obtaining the signature is to reach the half of the points which achievable during the semester according to the clause 3.3. In case of the homework and the midterm tests it is also required to reach the 50% of the points separately.

The final result of the student who has the signature but does not apply for examine course will be calculated from her/his better semester results.

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

3.5 Grading system

The attendance conditions achievers’s grade is determined by the following criteria:

The midterm grade is coming from the result of the three midterm test, and the homework.

The final grade is computed as the weighted of the midterms and exam as described in 3.3.
<table>
<thead>
<tr>
<th>grade</th>
<th>Points (P)</th>
</tr>
</thead>
<tbody>
<tr>
<td>excellent (5)</td>
<td>80&lt;=P</td>
</tr>
<tr>
<td>good (4)</td>
<td>70&lt;=P&lt;80%</td>
</tr>
<tr>
<td>satisfactory (3)</td>
<td>60&lt;=P&lt;70%</td>
</tr>
<tr>
<td>passed (2)</td>
<td>50&lt;=P&lt;60%</td>
</tr>
<tr>
<td>failed (1)</td>
<td>P&lt;50%</td>
</tr>
</tbody>
</table>

### 3.6 Retake and repeat

1) Homework – after the payment of the fee determinated in the regulation – can be submit with delay until 16.00 or in electronic format until 23:55 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 the point 2.

3) The three midterm test can be retaken in merged form in the completion week free of charge.

In case of correction the better result will be taking into account from the new and previous results.

### 3.7 Estimated workload

<table>
<thead>
<tr>
<th>Activity</th>
<th>hours/semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>contact hours</td>
<td>14×3=42</td>
</tr>
<tr>
<td>preparation for the courses</td>
<td>14×1=14</td>
</tr>
<tr>
<td>preparation for the tests</td>
<td>3×3+1×3=12</td>
</tr>
<tr>
<td>homework</td>
<td>6</td>
</tr>
<tr>
<td>home studying of the written material</td>
<td>16</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>90</strong></td>
</tr>
</tbody>
</table>

### 3.8 Effective date

September 1, 2020.