

# SUBJECT DATASHEET

---

## I. SUBJECT SPECIFICATION

### 1 BASIC DATA

#### 1.1 Title

---

ENVIRONMENTAL GEOLOGY

#### 1.2 Code

---

BMEEOGMMG-2

#### 1.3 Type

---

Module with associated contact hours

#### 1.4 Contact hours

---

type	hours/week
lectures	2
seminars/exercise classes	1

#### 1.5 Evaluation

---

midterm grade

#### 1.6 Credits

---

4

#### 1.7 Coordinator

---

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

#### 1.8 Department

---

Department of Engineering Geology and Geotechnics ([www.gmt.bme.hu](http://www.gmt.bme.hu))

#### 1.9 Website

---

[www.epito.bme.hu/BMEEOGMMG-2](http://www.epito.bme.hu/BMEEOGMMG-2)

#### 1.10 Language of instruction

---

Hungarian and/or English

#### 1.11 Curriculum requirements

---

Compulsory in the Structural engineering (MSc) programme Specialization of Engineering Geology and Geotechnics

Optional in the Structural engineering (MSc) programme

#### 1.12 Prerequisites

---

None

#### 1.13 Effective date

---

September 1, 2017.

## 2 OBJECTIVES AND LEARNING OUTCOMES

### 2.1 Objectives

---

The students are getting familiar with the pollution sources that endanger environment and understand the mitigation methods. The subject provides information on the transport mechanism of pollutants in subsurface area and the conditions that influence their dispersion. The studied topics include the legal regulation of environmental geological surveys and the geological constrains of environmental impact assessment of existing and planned engineering structures. By studying remediation techniques the course leads a better understanding of various methods of pollutant removal from the geological environment. Special focus area is mining related pollution and site remediation. Waste disposal and pollution control also form important parts of the course. The exercise classes help students to learn environmental geological practice that helps in the sustainable operation and design of engineering structures. The course provides perspectives in environmental pollution reduction and in cost effective mitigation of polluted sites.

### 2.2 Learning outcomes

---

Upon successful completion of this subject, the student:

#### A. Knowledge

1. knows the activities risking geological environment,
2. knows the pollutants and their properties
3. knows the transport mechanism of pollutants in geological environment,
4. aware of methodology of measuring pollutants,
5. knows the environmental geological site survey, and its legal background
6. understand the environmental impact assessment
7. aware of the 'pollution sensitivity' of various rock types,
8. knows the fundamentals of remediation techniques,
9. understand the geological constraints of waste disposal,
10. knows the environmental geological risk assessment

#### B. Skills

1. able to describe pollutants and their effect on living and built environment,
2. can identify the hazardous materials,
3. able to determine the critical concentrations of pollutants,
4. can assess the pollution sensitivity of geological formations,
5. able to choose specific sites for waste disposal,
6. can select a proper remediation action in cleanup projects
7. able to supervise cleanup projects
8. able to select the parameters necessary for environmental geological risk analysis
9. can read and interpret international references and written reports
10. able to express her/his thoughts orderly in written and oral.

#### C. Attitudes

- a) improve her/his knowledge with continuous learning,
- b) open to use the information technology tools,
- c) pursue to know and use of the toolkit which need for the environmental geological problem solution,
- d) pursue to the exact and errorless task solution.

#### D. Autonomy and responsibility

1. thinks through and solve independently the environmental geological tasks and problems according to given sources,
2. open to understand the severity of pollution and make responsible decisions in environmental remedial and cleanup actions
3. open to accept the critical comments,

4. use the systematic approaches in her/his mind.

### 2.3 *Methods*

---

Lectures, practical tasks, communication in written and oral form, use of IT tools and techniques, task solved independently and in groups as well, work organization techniques.

### 2.4 *Course outline*

---

week: Topics of lectures and/or exercise classes

1. Environmental geology topics, local and global perspective.
2. Types and characteristics of pollutants occurring in geological environment.
3. Sources of pollutants and the pathways to geological environment.
4. Conditions that influence the pollution transport and dispersion in geological formations.
5. Engineering geological aspects of environmental impact assessment.
6. Environmental geological site surveys and their application in engineering.
7. Pollution in lithosphere.
8. Remediation methods and the legal background.
9. Environmental impact of mining.
10. Waste and waste disposal in geological formations.
11. Site selection methods and environmental geological considerations of waste disposal.
12. Geological protection, site preservation and environmental geological protection
13. Role of environmental geology in engineering design and the methodological approach, legal constraints.
14. Pollution risk reduction and environmental geologically sustainable design.

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. Keller E., D. (2011): Environmental Geology. Pearsons

b) Online materials

1. Lecture notes

### 2.6 *Other information*

---

- 1) The topics lectures provide information on of Hungarian and international case studies related to environmental geology.

## 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](mailto:torok.akos@epito.bme.hu)

## II. SUBJECT REQUIREMENTS

### 3 ASSESSEMENT 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 tests, homework assignments.

#### 3.2 Assesement methods

Evaluation form	abbrev.	assessed learning outcomes
1. midterm test	MT1	A.1-A.5; B.1; B.2; B.6; C.2; C.4; D.3
2. midterm test	MT2	A.6-A.10; B.6-B.10; C.2; C.4; D.3
1. homework	HW	A.1-A.10; B.1-B.10; C.1-C.4; 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.

#### 3.3 Evaluation system

abbreviation	score
MT1	35%
MT2	35%
HW	30%
<b>Sum</b>	<b>100%</b>

The midterm test is failed if the sum points of the two tests are less than the 50% of the obtainable points. In case of the homework to reach the 50% of the points is also required.

#### 3.4 Requirements and validity of signature

There is no signature for this subject.

#### 3.5 Grading system

Determination of the final grade is according to the below described considerations:

There is no minimum requirement for the midterm tests separately; the sum results of the two midterm test have to reach at least 50% of the obtainable points.

The final grade is the average value of the result of the two midterm test and the homework weighted according to the clause 3.3.

grade	points (P)
excellent (5)	$80 \leq P$
good (4)	$70 \leq P < 80\%$
satisfactory (3)	$60 \leq P < 70\%$
passed (2)	$50 \leq P < 60\%$
failed (1)	$P < 50\%$

### 3.6 *Retake and repeat*

---

- 1) There is no minimum requirement for the individual midterm tests therefore it cannot be retaken separately.
- 2) Homework – after the payment of the fee given in the regulation – can be submit with delay until 16.00 or in electronic format until 23.59 of the last day of the completion week.
- 3) The submitted and accepted homework can be corrected without any fee until the deadline described in the point 2.
- 4) The two 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*

---

<b>activity</b>	<b>hours/semester</b>
contact hours	14×3=42
preparation for the courses	14×1=14
preparation for the tests	2×16=32
homework	20
home studying of the written material	12
<b>in total</b>	<b>120</b>

### 3.8 *Effective date*

---

September 1, 2017.