



MISKOLCI EGYETEM

**MŰSZAKI FÖLD- ÉS
KÖRNYEZETTUDOMÁNYI
KAR**

PHYSICAL GEOLOGY

MSc in Earth Science Engineering
2023/24/I. semester

MFFTT710001

COURSE COMMUNICATION FOLDER

**University of Miskolc
Faculty of Earth and Environmental Sciences and Engineering
Institute of Exploration Geosciences**

Datasheet of the course

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| Course title: Physical Geology Teacher: Éva Hartai, Honorary Professor, PhD | Code of the course: MFFTT710001 Responsible institute: Institute of Exploration Geosciences |
| | Type of course: C |
| Recommended semester: 1 | Pre-requisites: - |
| No. of contact hours/week (sem.+lab.): 2+1 | Type of assessment (exam/pr. mark/other): exam |
| Credit points: 4 | Course: full-time |

Competencies to evolve:

Knowledge: T1, T2, T3, T7, T8, T9

Ability: K1, K2, K3, K5, K6, K7, K9, K11, K12, K13

Attitude:

Autonomy and responsibility: F1, F2, F3, F4, F5

Description of the course:

Understanding the processes described by the general and specific theories required for the practising of the fields of earth science engineering (geologist-engineering, geophysical-engineering, geoinformatics-engineering), understanding the internal connections between geological processes, and knowing the planning and interpretation procedures based on the processes. Providing a solid technical and scientific knowledge required for the high-level progress in earth sciences engineering disciplines, among others in numerical methods, technical physics and their contexts.

Acquired store of learning:

Study goals: Deepening the students' abilities for geological interpretation, reconstruction of rock-forming processes.

Course content: The formation and the inner structure of the Earth. Plate tectonic background of the geological processes. The role of physical geology in the geological exploration. Methodology of fieldwork, interpretation of the magmatic, sedimentary and metamorphic rock forming processes in field. Principles of stratigraphy, stratigraphic nomenclature. Stratotype, lito-, bio- and chronostratigraphy. Modern stratigraphic methods: magneto-, chemo-, seismic, sequence, and cycle stratigraphy. Reconstruction of paleo-environments by the investigation of sedimentary sequences. Identification of rock-forming processes and tectonic events, defining their succession.

Education method: Obligatory attendance of the lectures and the two fieldtrips. Students present the results of one fieldtrip by a Power Point presentation, and submit a written report on the other fieldtrip.

Type of Assessment (exam. / pr. mark. / other): **exam**

Attendance of lectures is obligatory. During the semester students have to complete two field programmes: 1) Studying sedimentary rocks. Visiting outcrops with the teacher's explanation, presenting their observations and interpretations in an oral presentation (15% in the final assessment). 2) Studying magmatic rocks. Examining magmatic outcrops in groups of two, submitting written report on their work (15% in the final assessment). Final exam: written test and oral exam (70%).

Grading limits:

>80%: excellent,

70-79%: good,

60-69%: medium,

50-59%: satisfactory,

<50%: unsatisfactory.

The 3-5 most important compulsory, or recommended literature (textbook, book) resources:

- Sam J. Boggs: Principles of Sedimentology and Stratigraphy, Prentice Hall Publishing, 2011
- Angela L. Coe: Field techniques. Wiley-Blackwell 2010
- Steven Earle: Physical Geology. BCCampus, 2015

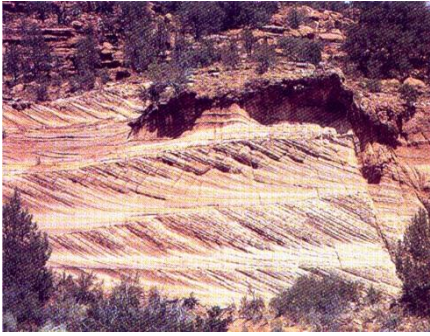
Themes of the lectures, 2023/24 fall semester

Lectures: Wednesday, 12:00-14:00, Room LFFT.

Practical exercises: Wednesday, 14:00-15, Room LFFT.

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| 2023-09-13 | The formation and the inner structure of the Earth |
| 2023-09-27 | Plate tectonic background of the geological processes |
| 2023-10-04 | The role of physical geology in the geological exploration- Magmatic processes, their interpretation on field |
| 2023-10-11 | Fieldtrip to the Tokaj Mountains, studying magmatic rocks |
| 2023-10-18 | Fieldtrip to the Bükk Mountains, studying sedimentary rocks |
| 2023-10-25 | Sedimentary processes, their interpretation on field |
| 2023-11-08 | Metamorphic processes, their interpretation on field |
| 2023-11-15 | Principles of stratigraphy, stratigraphic nomenclature |
| 2023-11-22 | Stratotype, lito-, bio-, chrono-, magneto-, chemo-, seismic, sequence and cycle stratigraphy |
| 2023-11-29 | Reconstruction of continental sedimentary environments |
| 2023-12-06 | Reconstruction of marine sedimentary environments |
| 2023-12-13 | Defining the succession of rock-forming processes and tectonic events |

5. Name the structural/textural features related to the pictures below, explain their formation, name the rock:



6. Specify the textural types of carbonates in Dunham's (1962) classification, give a short characterisation for each group:

7. Lows of stratigraphy, short characterisations:

8. Explain by illustrations how we can identify overturned layers:

9. Principles of sequence stratigraphy, orders of sequence units:

Miskolc, 14.09.2023

Éva Hartai
Honorary Professor