



HISTORICAL GEOLOGY

Earth Sciences Engineering MSc
2018/19 II. semester

COURSE COMMUNICATION FOLDER

University of Miskolc
Faculty of Earth Science and Engineering
Institute of Mineralogy and Geology

Course Title: Historical geology Responsible Instructor: György Less Dr., professor, DSc	Neptun code: MFFTT720028 Responsible Department: Dpt. of Mineralogy and Geology
	Type of course: C
Position in Curriculum (which semester): second	Pre-requisites: Physical geology (MFFTT 710001)
Type (lec. / sem. / lab. / consult.) and Number of Contact Hours per Week: lec. 2, sem. 1	Type of Assessment (exam. / pr. mark. / other): exam
Credits: 4	Course: full-time
Study goals: The aim of the subject is to give knowledge (1) on the role of time in the geological processes, (2) on the different methods of age-determination, (3) on the structural evolution of the Earth and (4) on the history of life in the Earth with special emphasis on the utility of all these in prospecting raw materials) and how to reconstruct paleoenvironments in geology as basic information for raw material exploration. Competencies to evolve: T1, T2, T3, T4, T5, T7, T8, T9, K1, K2, K3, K5, K6, K7, K9, K11, K12, K13, A1, A2, A3, A4, A5, A7, F1, F2, F3, F4, F5	
Course content: Principles of stratigraphy. Basic principles of stratigraphy, litho-, bio- and chronostratigraphy. Different methods of stratigraphical correlation and their significance in raw material prospecting. Age-determining methods: biostratigraphy, radiometry, magnetostratigraphy, chemostratigraphy, event stratigraphy, sequence stratigraphy. Reconstruction of different palaeoenvironments and their application in raw materail prospecting. Different magmatic, metamorphic and sedimentary facies types. The geological time scale, the structural, climatological and biological evolution of the Earth during the Precambrian, the Paleozoic, the Mesozoic and the Cenozoic. The evolution of Homoidea.	
Inter-semester control: Criterion for signature: Completion of inter-semester test with at least satisfactory result (see below). It can be repeated once. Practical requirements: obligatory participation in the field-trips, ppt-presentation for one of them. Grading limits: 80%: excellent, 70–80%: good, 60–70 %: average, 50–60%: satisfactory, <50%: unsatisfactory	
The 3-5 most important compulsory, or recommended literature (textbook, book) resources: Levin, H.L. (2006) – The Earth Through Time, 8th Ed., 616 p., Wiley Barnes, C.W. (1988): Earth, Time and Life. John Wiley and Sons, New York Brookfield, M. (2006): Principles of Stratigraphy. <i>Blackwell Publishing</i> , New York	

Syllabus of the semester

Historical geology

Lecture: Tuesday, 12:00 – 14:00

Practical: Tuesday, 14:00 – 15:00

Week	Thematics of lecture
2019.02.12.	Principles of stratigraphy. Types of bedding
2019.02.19.	Relationship between different rock bodies. Unconformity types
2019.02.26.	Chronostratigraphy: age-determination of rocks. Geological time scale and stratotypes
2019.03.05.	Fundamentals of biostratigraphy. Most important fossils in determining age and facies I
2019.03.12.	Most important fossils in determining age and facies II
2019.03.19.	Fundamentals of radiometric age-determination and fission-track dating
2019.03.26.	Magnetostratigraphy and chemostratigraphy
2019.04.02.	Cyclostratigraphy and sequence stratigraphy
2019.04.09.	Integration of different stratigraphical methods: stratigraphical correlation
2019.04.16.	Basin analysis: synthesis of stratigraphic and other methods; their role in raw material exploration
2019.04.23.	Main tectonic, paleoclimatic and paleobiological events of the Precambrian
2019.04.30.	Main tectonic, paleoclimatic and paleobiological events of the Paleozoic
2019.05.07.	Main tectonic, paleoclimatic and paleobiological events of the Mesozoic
2019.05.14.	Main tectonic, paleoclimatic and paleobiological events of the Cenozoic

Thematics of practices

Two field surveys, one day each: in the Bükk and Aggtelek-Rudabánya Mountains.

1. field-trip (one full day in the first half of April): Miskolc – Hollós-tető – Répáshuta, Bánya-hegy – Heregrét – Lök-völgy– Szarvaskő– Tardosi kőfejtő – Nagyvisnyó, Mihalovits quarry – Nagyvisnyó, 1. railway cut – Dédestapolcsány – Nékézseny, Strázsa-hegy – Csernely – Dédestapolcsány, vineyards – Sajólászlófalva – Miskolc
2. field-trip (one full day in the second half of April): Miskolc – Rudabánya – Szuhogy – Perkupa, Telekesoldal – Perkupa, Templom-domb – Szin, lower mill – Szögliget – Tornaszentandrás – Bódvalenke – Hídvérgárdó, cemetery – Rakacaszend – Miskolc

Tasks for inter-semester rating

1. The origin of oceanic water
2. When and in which conditions could be formed loess?
3. The beginning of formation of the Atlantic Ocean
4. When did the capture of the Moon happen?
5. Characteristic planktonic organisms of the Mesozoic seas
6. What is Fennosarmatia?
7. What is Panthalassa?
8. Timing and situation (between which continents?) of the closure of the Uralian Ocean
9. What are Hippurites? When and where did they live?
10. Time of orogenesis and erosion of the Caledonides?
11. Time and consequence of the separation of Australia from the Antarctica
12. When the level of the atmospheric oxygen reached the recent level and the significance of this event
13. Climate of the second half of the Permian and its effect on the formation of raw materials
14. What and why happened in the biosphere at the Silurian/Devonian boundary?

Grading limits:

> 80%: excellent, 70–80%: good, 60–70 %: average, 50–60%: satisfactory, <50%: unsatisfactory

Questions for exam:

1. The subject of stratigraphy, stratigraphic categorization and nomenclature
1. Lithostratigraphy, Steno's rule and exceptions
1. Bedding types, lateral termination of beds
1. Grouping beds into formation, Walter's law
1. Termination of formations, unconformity types
1. Methods of lithostratigraphical correlation
1. Biostratigraphy, Dollo's rule, main features (including way of life) of good age-determining fossils
1. Principles of biozonation, limitations, biozone types
1. Correlation of biozones and stratotypes
1. Principles, limitations and main types of radiometric dating
1. Fission track dating and limitations
1. Principles of magnetostratigraphy, limitations
1. Principles and main types of chemostratigraphy

2. Event stratigraphy and main rare events in the history of Earth
2. Evolution of flora from beginning to recent
2. Fauna of the Paleozoic
2. Evolution of vertebrates from beginning to recent
2. Main geotectonic events and paleogeography of the Paleozoic
2. Climate of the Pre-Cambrian and Paleozoic
2. Climate of the Mesozoic and Cenozoic
2. Main geotectonic events and paleogeography of the Mesozoic and Cenozoic
2. Life of the Pre-Cambrian
2. Evolution of Earth's atmosphere in the last 4500 million years
2. Fauna of the Mesozoic
2. Fauna of the Cenozoic
2. The Earth's Crust of the Pre-Cambrian