ACADEMIC COURSE DESCRIPTION – HISTORICAL GEOLOGY

BACHELOR'S DEGREE
GEOCHEMISTRY
2ND YEAR OF STUDY, 1ST SEMESTER

COURSE TITLE	HISTORICAL GEOLOGY
COURSE CODE	31020030020SL1112118
COURSE TYPE	full attendance
COURSE LEVEL	1stcycle (bachelor's degree)
YEAR OF STUDY, SEMESTER	2nd year of study, 1st semester
NUMBER OF ECTS CREDITS	5
NUMBER OF HOURS PER WEEK	4 (2 lecture hours + 2 seminar hours)
NAME OF LECTURE HOLDER	Assistant Professor Paul Țibuleac
NAME OF SEMINAR HOLDER	Assistant Professor Paul Țibuleac
PREREQUISITES	Structural Geology, Sedimentary Petrology, Paleontology

A GENERAL AND COURSE-SPECIFIC COMPETENCES

General competences:

→ Effectively using additional sources and assisted learning resources in order to devise a research paper on a topic pertaining to the academic discipline (the geological evolution of a terrane)

→ Improving teamwork abilities within a research team

→ Synthesizing the information on the stages of the evolution of a terrane and presenting it in front of colleagues or during student conferences

Course-specific competences:

→ Identifying and interpreting the information provided by the lithology (igneous, metamorphic and sedimentary rocks) and fossil assemblages of sedimentary successions in reconstructing the major stages in the evolution of a terrane

→ Applying stratigraphic principles and geological methods in order to highlight the major changes suffered by the terrestrial crust, in general, and by specific terranes across geological time

→ Recognizing, both in the field, and on maps, the connection between tectonic interactions and landforms, tectonic dislocations and major stages in the evolution of a terrane

B LEARNING OUTCOMES

Upon completing the discipline, students become capable of:

→ accurately placing a geological event/process from a terrane (fauna, accumulation of valuable minerals, tectonic event, discontinuity etc.) on the geological time scale

→ correlating the geological (paleontological, mineralogical, tectonical) data with the characteristics of a specific time span in our planet's geological history

→ comparing the data related to a specific geological event with data related to the time spans prior to it and following it

→ estimating the amplitude (intensity) of certain paleoenvironmental parameters (bathymetry, salinity, temperature, currents) by correlating lithological data with paleontological data

C LECTURE CONTENT

Week	Title of lecture	Teaching methods	Duration
1	Formation of planet Earth. The abiotic synthesis of organic compounds. The Miller-Urey experiment reconstructing the conditions of the Archean (Late Heavy Bombardment, hydrothermal vents, electrical discharges). The primordial soup. Protobionts and coacervates.	Lecture-debate	4 hours
2	Geochemical fossils. The endosymbiotic theory. Snowball Earth. Ediacara fauna	Lecture. Problematization.	2 hours
3	The Cambrian. Paleogeography and tectonics. The evolution of life. Representative life-forms. Subdivisions.	Lecture	2 hours
4	The Ordovician. Paleogeography and tectonics. The Ordovician extinction and glaciation. The evolution of life. Subdivisions.	Lecture	2 hours
8	The Silurian, the Devonian. Paleogeography and tectonics. The evolution of life and the Devonian extinction. Subdivisions.	Lecture	2 hours
9	The Carboniferous-Permian. Paleogeography and tectonics. The evolution of life and the Permian-Triassic extinction. Economic implications. Subdivisions.	Lecture	2 hours
10	The Mesozoic (Triassic, Jurassic, Cretaceous). Paleogeography and tectonics. The evolution of life and the Cretaceous-Paleogene extinction. Subdivisions.	Systematized lecture. Problematization.	6 hours
11	The Paleogene. Paleogeography and tectonics. The evolution of life. Subdivisions.	Lecture	2 hours
12	The Miocene. Paleogeography şi tectonics. The evolution of the Paratethys. The evolution of life. Subdivisions.	Lecture-debate	4 hours
13	The Pliocene-Quaternary. Paleogeography şi tectonics. The evolution of life. Subdivisions.	Lecture	2 hours

D RECOMMENDED READING FOR LECTURES

Gradstein, F. M., Ogg, J. G., Schmitz, M., D., Ogg, G., M. 2012. The Geological Time Scale. 1176 p., Elsevier – Online version from ScienceDirect.com

Ashraf, M. T. E., 2008. Mass Extinction. Springer-Verlag Berlin Heidelberg, 252 p.

Hallam, T. 2004. Catastrophes and lesser calamities. The causes of mass extinctions, Oxford University Press, 226 p.

www.scotese.com, http://.www.ucmp.berkley.edu

E	SEMINAR CONTENT

Week	Title of seminar	Teaching methods	Duration
1	Principles of stratigraphic nomenclature and classification	Application	2 hours
2	Lithostratigraphic units: layer, member, formation, group. Elements of magnetostratigraphy and cyclostratigraphy.	Demonstration. Application.	2 hours
3	Relative dating. Biozones. Types of biozones (examples from the Paleozoic)	Application	4 hours
5	Field applications	Demonstration	4 hours
6	Interpreting mapping data– cvasihorizontal layers. Devising geological maps with horizontal layers (example: the Neozoic)	Demonstration. Case study.	6 hours
7	Paleoenvironmental reconstructions based on invertebrate assemblages	Application	4 hours
8	Absolute dating. The K-Ar and Nm-Sa rock-dating methods	Demonstration. Case study.	2 hours

F RECOMMENDED READING FOR SEMINARS

Amos, S. (ed). 1994. International Stratigraphic Guide. A guide to stratigraphic classification, terminology, and procedure. The International Union of Geological Sciences and The Geological Society of America, 212 p

Koutsoukos, E. (ed.). 2004. Applied Stratigraphy. Springer, The Netherlands, 488 p.

Ionesi, L. Ionesi, B., Lungu, A., Roşca, V., Ionesi, V. 2005. Sarmaţianul mediu şi superior de pe Platforma Moldovenească. Editura AcademieiRomâne, 558 p.

Moissette P., Dulai, A., Escarguel, G., Kázmér, M., Müller, P., Saint Martin, J.-P., 2007. Mosaic of environments recorded by bryozoan faunas from the Middle Miocene of Hungary. Paleogeography, Palaeoclimatology, Paleoecology, 252, pp. 530-556.

White, W., M. Geochemistry. Chapter 8: Radiogenic Isotope Geochemistry. http://www.imwa.info/geochemistry/Chapters/Chapter08.pdf.

G EDUCATION STYLE

LEARNING AND TEACHING METHODS	Lecture-debate, demonstration, application, problematization, case study
ASSESSMENT METHODS	Ora assessment and research paper (lecture) – 70%, practical assessment and portfolio (seminar) – 30%
LANGUAGE OF INSTRUCTION	English