| **1. Course title:** Historical Geology and Paleontology | | | | |
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| **2. Code:** | | **3. Type (lecture, seminar, laboratory):** seminar | | |
| **4. Total of contact hours:** 39 hours | | **5. Number of credits (ECTS):** 3 | | |
| **6. Pre-requisites (max. 3):** none | | | | |
| **7. Announced:** ☐ autumn semester, ☒ spring semester, ☐ both semesters | | | | |
| **8. Limit for participants:** | | | | |
| **10. Instructor-in-charge (faculty, institute and department):**  László BUJTOR, PhD (FS, Institute of Geography, Department of Geology and Meteorology) | | | | |
| **11. Instructor(s) and percentage:** | | László BUJTOR | | 100 % |
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| **12. Language:** English | | | | |
| **13. Course objectives and learning outcomes:**  Objectives:  The aim of the course is to present the history of planet Earth, namely introducing into the periods and milestones of Earth history, describing the major events and eras, periods, epochs, ages; introducing the dynamic Earth concept and its continuously changing model; understanding the mutual dependencies of bio- and geodiversities and presenting the best examples; Presenting the evolution of life on Earth and its major steps. Learning that the evolutionary steps are not accidental but always based on the previous developments and always understandable from the previous developments of life.  Learning outcomes:  Students successfully performing the course should know the geologic time scale, the major moments/milestones of evolution of life on Earth. They should know the basics and principals of stratigraphy, faciology, and evolutionary theory; they should know the methods of geological timing, the names and durations of geologic eons, periods and epochs (only for Cenozoic). They should know the appropriate nomenclature and terms and are able to use them in right context. They should know the scientists and their achievements who contributed the most to geology and palaeontology. They should able to know them and refer their scientific results/contributions. They should be able to understand the interrelationships of these sciences and their dependencies on each other. Based on the acquired knowledge they should be able to understand and explain the development of Earth and its life forms and put the milestones of the development in right order. They should able to explain the evolution on Earth and recognize the turning points in evolution. On the field they are able to recognize and understand the litho- and biofacies. They are able to understand and explain the Darwinian evolutionary theory and are able to cite examples from the fossil record. They know the micro- and macroevolution and able to cite examples for both from the fossil record. They are able to explain the big five extinction events of the Phanerozoic and their possible causes and are able to explain their impacts on the further developments of life in Earth. | | | | |
| **14. Course outline / Milestones**   1. Introduction of the course and presenter. Great scientists in Geology and Palaeontology and their major achievements. 2. Formation of planet Earth and its early development. The primordial atmosphere. The appearance of life in Earth and its early development. 3. Formation of the early atmosphere. Development of life and the atmosphere in the Archaean. 4. The Proterozoic Eon. The Snowball-Earth. Radiation of the early life forms. Further development of the atmosphere. 5. Development of the animals. Formation of the major animal clades. Systematics of kingdom Animalia and evolutionary connections of the major Phyla. Body plans of the major animal phyla. 6. Stratigraphy. Bio- and lithostratigraphy. Chronostratigraphy. Absolute and relative timing and its methods. 7. Faciology. Bio- and lithofacies. Limits of the Uniformitarianism. The most remarkable bio- and lithofacies in Earth history. 8. Early Cambrian life explosion. History of Life and its development in the Early Palaeozoic. 9. History of Life and its development in the Late Palaeozoic. The biggest extinction event in Earth: the P/T extinction and its possible causes. 10. History of Life and its development in the Mesozoic. 11. History of Life and its development in the Cenozoic. 12. The evolutionary theory. Darwin vs. Wallace. Speciation and macroevolution. The mankind and the human evolution. 13. Future of Palaeontology. Exobiology. Possibility of life on exoplanets. Dubious life forms from mars on Earth. Other potential places in the Solar system to host life forms. | | | | |
| **15. Mid-semester works** | | | | |
| **16. Summative assessment, formative assessment**  Only one Final Exam. There will be a traditional, sit-down final exam during the regularly scheduled exam season. Grade Scale: ≥90, 5; 80-89, 4; 70-79, 5; 60-69, 2; <60, 1. | | | | |
| **17. Reading assignments:**   1. *Earth System History* 3rd Edition by Steven M. Stanley (2009, W.H. Freeman & Co., ISBN-13978-1429233491) 2. *Introduction to Paleobiology and the Fossil Record* 1st Ed. by Michael Benton and David Harper. (2009, Wiley - Blackwell Co. ISBN 978-1405141574 | | | | |
| **18. Recommended texts:**  [1] Margulis, L. & Chapman, M.J. (2009): *Kingdoms and domains. An illustrated guide to the Phyla of Life on Earth*. - Academic Press, ISBN 9780123736215.  [2] Lovelock, James (2016): *Gaia. A new look at life on Earth.* - Oxford University Press, ISBN 978-019-878-488-3.  [3] Understanding Evolution. The University of Berkeley.<http://evolution.berkeley.edu/evolibrary/home.php>  [4] Alien Planet - Darwin 4. Discovery Channel, 2005.<http://www.emol.org/tv/alienplanet/> | | | | |
| **Date** | 13 November, 2017 | **Prepared** |  | |
| László BUJTOR PhD  instructor-in-charge | |
| **Endorsed** | | |  | |
| András TRÓCSÁNYI PhD leader of the program | |