Annex No. 5

to Ordinance No. 21/2019

**COURSE/MODULE SYLLABUS FOR UNIVERSITY COURSES/PhD STUDIES**

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|  | Course/module name in Polish and English  Geochemical Evolution of the Earth/ Ewolucja geochemiczna Ziemi | | |
|  | Discipline  Earth and Environmental Science | | |
|  | Language of instruction  English | | |
|  | Teaching unit  Faculty of Earth Sciences and Environmental Management, Institute of Geological Sciences, Department of Experimental Petrology | | |
|  | Course/module code  USOS | | |
|  | Type of course/module *(mandatory or optional)*  optional | | |
|  | Field of studies (major, if applicable)  Geology | | |
|  | Level of higher education *(undergraduate (I cycle), Master’s (II cycle), 5 year uniform Master’s studies)*  Master’s (II cycle) | | |
|  | Year of studies *(if applicable*)  I/II | | |
|  | Semester *(winter or summer)*  winter/summer | | |
|  | Form of classes and number of hours  Lectures: 14  Lab classes: 24  Teaching methods  Multimedia lecture, individual work, group work, preparation of reports. | | |
|  | Name, title/degree of the teacher/instructor  Coordinator: dr hab. Anna Pietranik, prof. UWr  Lecturer: dr hab. Anna Pietranik, prof. UWr, prof. dr ha. Jacek Puziewicz  Classes instructor: dr hab. Anna Pietranik, prof. UWr, prof. dr ha. Jacek Puziewicz | | |
|  | Course/module prerequisites, in terms of knowledge, skills, social competences  Basic knowledge and skills in the field of math and geology, and computer skills. | | |
|  | Course objectives  The course provides students with the knowledge of geological processes and, in particular, with their secular evolution of the Earth from the formation of the Solar System to the present day. Students are taught how to model selected processes using geochemical modelling tools.  Lectures are focused on presenting up-to-date information on the Earth evolution as well as on the analytical methods used to gather geochemical data and the data interpretation.  Classes (in computer laboratory) are focused on teaching student the tools of geochemical modelling and calculation of rock ages by means of basic and freeware computer programs. Student gets also familiarized with geological databases and how to use them. | | |
|  | Course content  Lectures:  Geochemical and isotope diversity of the present day Earth. Characteristic of the processes leading to this diversity and their secular evolution. Isotope systems and geochemical data used to understand secular evolution of the Earth chemical composition. Nucleosynthesis and geochemical evolution of the Solar System before the Earth formation. Detailed evolution of the Earth in each era: Hadean, Archean, Proterozoic, Paleozoic.  Exercises carried out in the computer lab:  Basics of the geochemical modelling. Equations used in isotope geology to calculate interactions between isotopically diverse materials. Geochemical databases and how to use them. Writing Excel spreadsheets and using the Isoplot software to solve geological problems. | | |
|  | Intended learning outcomes  W\_1 Knows the chemical and isotope diversity of the Earth as well as geological processes leading to this diversity.  W\_2 Knows the evolution of the scientific ideas that led to the current theories on the Earth evolution.  W\_3 Recognizes and classifies different rocks as derived from diverse components of the Earth based on their chemical and isotope composition.  U\_1 Correctly chooses methods of geochemical and isotope modelling to solve geological problems.  U\_2 Knows the popular geochemical databases and knows how to use the data  K\_1 Is able to verify their own beliefs and knowledge based on new data.  K\_2 Understands the social responsibility resulting from the geochemical and isotopic data presented in the form of results, reports and conclusions. | Symbols of learning outcomes for particular fields of studies,  K2\_W02, K2\_W03  K2\_W08  K2\_W04  K2\_U03, K2\_U05  K2\_U03, K2\_U05  K2\_K01, K2\_K06  K  2\_K01, K2\_K06 | |
|  | Required and recommended reading *(sources, studies, manuals, etc.)*  Basic literature:  Tolstikhin, I. N., Kramers, Jan, 2008, The Evolution of Matter : From the Big Bang to the Present Day. Cambridge University Press. – the book is freely available at the University Library  Up-to-date and the most downloaded papers published in the following journals: Elements, Nature, Science, Nature Geoscience, Geology, Earth and Planetary Science Letters, Chemical Geology, Acta Geochimica et Cosmochimica and others | | |
|  | Assessment methods for the intended learning outcomes:  - Lecture: written test: K2\_W02, K2\_W03, K2\_W08, K2\_U03 – 50% of the total mark  - Classes:preparation and implementation of reports: K2\_W04, K2\_U03, K2\_U05, K2\_K01, K2\_K06. | | |
|  | Credit requirements for individual components of the course/module:  -Lecture: written test: : 1-hour open test (in English):  -Classes: obligatory two reports, final mark – mean mark from the two reports Attendance in classes obligatory, if absent student should participate in consultation | | |
|  | Total student effort | | |
| form of student activities | | number of hours for the implementation of activities |
| classes (according to the plan of studies) with a teacher/instructor:  - lectures:14  - classes: 24 | | 38 |
| student's own work (including group-work) such as:  - consultation:12  - being prepared for classes: 5  - reading the suggested literature: 10  - writing a class report: 15  - preparing for tests and exam: 20 | | 62 |
| Total number of hours | | 100 |
| Number of ECTS credits | | 4 |