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  Mineral resources, economics and the environment/Zasoby mineralne, ekonomia i środowisko | | |
|  | Discipline  Earth and Environmental Science | | |
|  | Language of instruction  English | | |
|  | Teaching unit  Faculty of Earth Science and Environmental Management, Institute of Geological Sciences, Department of Economic Geology | | |
|  | Course/module code  USOS | | |
|  | Type of course/module *(mandatory or optional)*  optional | | |
|  | Field of studies (major, if applicable)  Geology (spec. Applied Geoscience) | | |
|  | 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*)  II | | |
|  | Semester *(winter or summer)*  winter | | |
|  | Form of classes and number of hours  Lectures: 24  Teaching methods  Multimedia lecture. | | |
|  | Name, title/degree of the teacher/instructor  Coordinator: Prof. dr hab. Andrzej Solecki  Lecturer: Prof. dr hab. Andrzej Solecki, Dr Dagmara Tchorz-Trzeciakiewicz | | |
|  | Course/module prerequisites, in terms of knowledge, skills, social competences  Basic knowledge of dynamic geology. | | |
|  | Course objectives  Familiarization with the geological, economic and environmental issues of managing mineral resources. | | |
|  | Course content  Mineral resources in the history of civilisation  Factors controlling the mineral commodities demand  Geological, technological and economic factors controlling mineral availability  Energy resources: fossil fuels, U, Th and their deposits  Metals: iron and ferroalloy metals - Mn, Ni, Cr,Co, Mo, V,W; light and base metals- Al, Mg, Ti, Cu, Pb, Zn, Sn , metals of new technologies, precious metals Au, Ag, PGE.  main types of metal deposits: Porphyry copper deposits, VMS, MVT, Layered Mafic Intrusions, IOCG, BIF,SEDEX, Sediment hosted deposits of Cu and U, stratiform, Unconformity U Deposits, Deposits of weathering zone  Mineral resources of chemical industry: carbonates, evaporates, potash, phosphate, nitrogen compounds and nitrates  Mineral resources of the construction industry: stones, aggregates, cement and ceramic raw materials, sorbents and insulators  Mineral resources management and environmental impact | | |
|  | Intended learning outcomes  P\_W01 Student knows the mineral resources and the basic types of deposits of these raw materials.  P\_W02 Student knows the economic, ecological and geological factors influencing the extraction and utilization of minerals.  P\_W03 Student knows the possibilities of mineral resources application.  P\_U01 Student is able to assess the prospects of mineral deposits development and economic and environmental impacts.  P\_K01 Student can critically analyse the obtained information. He is aware of necessity of expanding his knowledge about mineral resources. | Symbols of learning outcomes for particular fields of studies, *e.g. K\_W01\**, *K\_U05,K\_K03*  K2\_W01, K2\_W07, K2\_U02  K2\_W03  K2\_W04  K2\_U03  K2\_W08, K2\_U03, K2\_K04,  K2\_K07 | |
|  | Required and recommended reading *(sources, studies, manuals, etc.)*  Required reading  Evans A.M. 1997: An Introduction to Economic Geology and Its Environmental Impact. pp. 396.  J.R. Craig, D.J. Vaughan, B.J. Skinner 2014: Earth Resources and the Environment (4-th edition).  Kesler S.E., Simson A.C. 2015 - Mineral Resources. Cambridge University Press  Gluyas J., Swarbrick R.2004: Petroleum Geoscience . Blackwell Publishing  Roberts R.G., Sheahan P.A. (1994) - Ore deposit models. Geoscience  Canada.  Osika R., 1990: Geology of Poland-Mineral deposits Vol. 6. Warszawa  Wydawnictwa Geologiczne pp. 314 Economics of the Mineral Industries,  William A. Vogely, Editor, 4th Edition, 1985  Hutchison C.S. 1983: Economic Deposits and their tectonic Setting.  MacMillan Education. pp. 365  H.G. Dill, The “chessboard” classification scheme of mineral deposits: Mineralogy and geology from aluminum to zirconium, [Earth-Science Reviews](http://www.sciencedirect.com/science/journal/00128252), [V 100, 1–4](http://www.sciencedirect.com/science/journal/00128252/100/1), 1–420  Recommended reading  <https://www.911metallurgist.com/blog/types-of-ore-deposits> | | |
|  | Assessment methods for the intended learning outcomes:  Written test. K2\_W01, K2\_W03, K2\_W04, K2\_W07, K2\_W08, K2\_U02, K2\_U03, K2\_K04, K2\_K07. | | |
|  | Credit requirements for individual components of the course/module:  Lecture:  - written test - (open), 60% scores required for positive result. | | |
|  | 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: 24  - consultations: 14 | | 38 |
| student's own work (including group-work) such as:  - reading the suggested literature: 17  - preparing for tests and exam: 20 | | 37 |
| Total number of hours | | 75 |
| Number of ECTS credits | | 3 |