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  Limnology/Limnologia | | |
|  | Discipline  Earth and Environmental Science | | |
|  | Language of instruction  English | | |
|  | Teaching unit  Faculty of Earth Science and Environmental Management, Institute of Geological Sciences, Department of Isotopic and Applied Geology | | |
|  | Course/module code  USOS | | |
|  | Type of course/module *(mandatory or optional)*  elective | | |
|  | 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: 14  Teaching methods  Multimedia lecture. | | |
|  | Name, title/degree of the teacher/instructor  Coordinator: Dr Adriana Trojanowska-Olichwer.  Lecturer: Dr Adriana Trojanowska-Olichwer. | | |
|  | Course/module prerequisites, in terms of knowledge, skills, social competences  Fundamentals of Hydrology and environmental chemistry. | | |
|  | Course objectives  To acquaint students with the basics of limnology, variability of processes, physicochemical and biological properties of the surface waters and cause and effect in terms of water quality and the impact of anthropogenic. | | |
|  | Course content  1. The origin of the lakes, genetic types of lakes, lakes classification.  2. Construction of zonal lake basin, morphometry of lakes, the importance of the basin.  3. Parameters and physical processes in lakes movements of masses of water, heat balance and distribution of time-space temperature, solubility of gases, penetration of light.  4. Chemical conversions in lakes: DIC and pH balance, cycle the circulatory C, N, P, S in the lake, trofie lakes, heavy metals, the role of sediment and replace the water - sediment.  5. Biological processes in lakes: primary production, trophic network in the lakes, and the importance of modeling.  6. Risks and degradation of lakes eutrophication, acidification, salinity, organic impurities.  7. remediation and revitalization of the lakes technical methods (dredging, pipe Olszewski, aeration), chemical (chemical inactivation of deposits, the use of coagulants, the use of barley straw), biological (biomanipulation, probiotics, microbial decomposition of cyanobacterial toxins, denitrification walls, Ecotones). | | |
|  | Intended learning outcomes  P\_W01 know the basics of ecological and environmental processes.  P\_W02 has knowledge of the current problems of earth sciences and environmental sciences and applied modern research methods in this field.  P\_W03 consistently applies the principle of strict, based on empirical data to interpret natural phenomena and processes in research and practical work.  P\_U01 Can apply advanced techniques and research tools in limnology.  P\_K01 understands the need for continuous learning and improving professional competence, as well as inspire and organize the learning process of others. | Symbols of learning outcomes for particular fields of studies, *e.g. K\_W01\**, *K\_U05,K\_K03*  K2\_W02  K2\_W03  K2\_W04  K2\_U01  K2\_K01 | |
|  | Required and recommended reading *(sources, studies, manuals, etc.)*  Required reading  O’Sullivan P.E. and Reynolds C.S. (eds.). 2003. The Lakes Handbook volume 1: Limnology and limnetic ecology. Volume 2: Lake Restoration and Rehabilitation. Blackwell Publishing.  Jorgensen S., Tundisi J.G., Tundisi T.M. 2013. Handbook of Island aquatic ecosystem management. CRC Press. | | |
|  | Assessment methods for the intended learning outcomes:  Lecture: test. K2\_W02, K2\_W03, K2\_W04, K2\_U01, K2\_K01. | | |
|  | Credit requirements for individual components of the course/module:  Lecture:  - test, 60% correct answers required to pass. | | |
|  | 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 | | 14 |
| student's own work (including group-work) such as:  - consultation: 11  - reading the suggested literature: 10  - preparing for tests and exam: 15 | | 36 |
| Total number of hours | | 50 |
| Number of ECTS credits | | 2 |