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  Groundwater quality/Jakość wód podziemnych | | |
|  | Discipline  Earth and Environmental Science | | |
|  | Language of instruction  English | | |
|  | Teaching unit  Faculty of Earth Science and Environmental Management, Institute of Geological Sciences, Department of General Hydrogeology | | |
|  | Course/module code  USOS | | |
|  | Type of course/module *(mandatory or optional)*  mandatory | | |
|  | 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*)  I | | |
|  | Semester *(winter or summer)*  summer | | |
|  | Form of classes and number of hours  Lectures: 14  Lab classes: 16  Teaching methods  Multimedia lecture, mini-lecture, practical exercises, individual work, group work, preparation of reports | | |
|  | Name, title/degree of the teacher/instructor  Coordinator: Dr Magdalena Modelska  Lecturer: Dr Magdalena Modelska  Classes instructor: Dr Magdalena Modelska | | |
|  | Course/module prerequisites, in terms of knowledge, skills, social competences  The knowledge and skills in the field of base of hydrogeology and environmental management | | |
|  | Course objectives  The objective of course is to provide students with methods of evaluation of groundwater quality; processes of forming chemical composition of groundwater, methods of assessing groundwater chemical status, symptoms suggestive of contamination and ways of preventing changes in groundwater quality. | | |
|  | Course content  Lecture  1. Processes forming the groundwater chemical composition and its influence on its quality.  2. The chemical composition of groundwater - assessment and presentation.  3. Chemical status of groundwater - assessment and presentation.  4. Indicators of pollution.  5. Basics of migration of pollutants in groundwater.  6. Hydrogeochemical background and its importance in the assessment of groundwater quality.  Classes  1. Methods of presentation of the chemical composition of groundwater.  2. Methods of evaluation and presentation of chemical status of water in accordance the applicable regulatory acts.  3. Methods of evaluation of groundwater pollution.  4. Methods of evaluation of hydrogeochemical background. | | |
|  | Intended learning outcomes  P\_W01 Student knows processes of forming the chemical composition of groundwater and its influence on the quality  P\_W02 Student knows basic methods evaluate the composition and status of groundwater  P\_U01 Student can make a presentation of the groundwater chemical composition and its chemical status in relation to currently applicable legal acts  P\_K01 Student is conscious of groundwater environmental risks  P\_K02 Student appreciates the role of communication in work and in team  P\_K03 Student shows caution in assessing the source information provided by other authors. | Symbols of learning outcomes for particular fields of studies, *e.g. K\_W01\**, *K\_U05,K\_K03*  K2\_W01, K2\_W03, K2\_W06,  K2\_W04, K2\_W08  K2\_U02, K2\_U03, K2\_U04  K2\_K06  K2\_K02  K2\_K06 | |
|  | Required and recommended reading *(sources, studies, manuals, etc.)*  Required reading  Applicable regulatory acts  Recommended reading  Deutsch W.J., 1997. Groundwater Geochemistry. Fundamentals and Applications to Contamination, CRC Press  Hem, John D. Study and Interpretation of the Chemical Characteristics of Natural Water, 3rd ed. Alexandria, VA: Department of the Interior, U.S. Geological Survey, Water-Supply Paper 2254, 1985. | | |
|  | Assessment methods for the intended learning outcomes:  Lecture: written test. K2\_W01, K2\_W03, K2\_W04, K2\_W06, K2\_W08, K2\_K06.  Classes: realization of Project. K2\_W04, K2\_W08, K2\_U02, K2\_U03, K2\_U04, K2\_K02. | | |
|  | Credit requirements for individual components of the course/module:  Lecture:  - written test, a positive result - obtaining at least 51% of points.  Classes:  - realization the all of projects assessed positively,  - attendance is obligatory,  - the opportunity to make up for an absence as part of an individual work.  Final grade – lecture 50%, classes - 50 %. | | |
|  | 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: 16  - consultation: 10 | | 40 |
| student's own work (including group-work) such as:  - being prepared for classes: 10  - reading the suggested literature: 5  - writing a class report: 10  - preparing for tests: 10 | | 35 |
| Total number of hours | | 75 |
| Number of ECTS credits | | 3 |