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  Microtectonics and microstructural analysis/Mikrotektonika i analiza mikrostrukturalna | | |
|  | Discipline  Earth and Environmental Science | | |
|  | Language of instruction  English | | |
|  | Teaching unit  Faculty of Earth Science and Environmental Management, Institute of Geological Sciences, Department of Physical Geology | | |
|  | 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*)  II | | |
|  | Semester *(winter or summer)*  winter | | |
|  | Form of classes and number of hours  Lectures: 24  Classes: 20  Teaching methods  Multimedia lecture, practical exercises, individual work, preparation of reports. | | |
|  | Name, title/degree of the teacher/instructor  Coordinator: Dr hab. Jacek Szczepański, Prof UWr.  Lecturer: Dr hab. Jacek Szczepański, Prof UWr., Dr Elżbieta Słodczyk  Classes instructor: Dr hab. Jacek Szczepański, Prof UWr., Dr Elżbieta Słodczyk, Dr Dawid Białek | | |
|  | Course/module prerequisites, in terms of knowledge, skills, social competences  Knowledge and skills in physical geology, petrology and tectonics (undergraduate level). | | |
|  | Course objectives  The primary objective of this course is to learn the basic techniques and skills required to describe and interpret structures in thin sections of magmatic (plutonic and volcanic) and metamorphic rocks. | | |
|  | Course content  Lectures  During the course the students will be acquainted with: deformation mechanisms (including intracrystalline deformation, recovery, recrystallisation, grain-boundary-area reduction, and static recrystallization), foliations, lineations, and lattice-preferred orientation (LPO), shear zones, mylonites, sense of shear, and microscopic shear-sense indicators and porphyroblasts (including porphyroblast nucleation and growth, inclusions in porphyroblasts, porphyroblast-matrix relations), crystal size distribution (CSD), modal composition, inclusions in varied minerals populations, microstructures related to specific conditions of crystallization  Laboratories  During laboratories students will learn basic software utilised in modern image analysis. Using software students will analyse sequence of images showing development of recrystallization microstructures originated during deformation of both synthetic materials and rocks. Students will also learn basics of interpretation of deformation microstructures related to formation of shear zones as well as metamorphism (with emphasis to porhyroblasts and their relationship to matrix of the rock) and will learn how to interpret crystal size distribution in magmatic rocks in order to describe conditions of their crystallization. | | |
|  | Intended learning outcomes  P\_W01 Student can describe and interpret observed microstructers.  P\_W02 Student knows modern techniques of microtectonics and microstructural analysis.  P\_W03 Student can synthesize the data he has collected and can formulate conclusions in a critical way on their basis.  P\_U01 Student can apply modern techniques of microtectonics and microstructural analysis. | Symbols of learning outcomes for particular fields of studies, *e.g. K\_W01\**, *K\_U05,K\_K03*  K2\_W08, K2\_W01  K2\_W02, K2\_W03  K2\_W04, K2\_W02  K2\_U01 | |
|  | Required and recommended reading *(sources, studies, manuals, etc.)*  Required reading  Microtectonics Passchier, Cees W., Trouw, Rudolph A. J. 2nd ed. 2005, XVI, 366 p. 322 illus.  Vernon, Ron H. 2004: A Practical Guide to Rock Microstructure. Cambridge University Press, 594 pp.  Higgins, M. D. 2006,. *Quantitative textural measurements in igneous and metamorphic petrology*. Cambridge University Press, 277 pp.  Recommended reading:  selected papers published in e.g. Journal of structural Geology, International Journal of Earth Sciences. | | |
|  | Assessment methods for the intended learning outcomes:  Lecture: written examination. K2\_W01, K2\_W02, K2\_W03, K2\_W04, K2\_W08, K2\_U01.  Classes: class reports prepared individually by students. K2\_W01, K2\_W02, K2\_W04, K2\_W08, K2\_U01. | | |
|  | Credit requirements for individual components of the course/module:  Lecture:  - written exam; positive result 60% of total points.  Classes:  - writing a class report; positive result 60% of total points. | | |
|  | 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  - classes: 20 | | 44 |
| student's own work (including group-work) such as:  - being prepared for classes: 5  - reading the suggested literature: 15  - preparing papers/presentations/projects: 15  - writing a class report: 15  - preparing for tests and exam: 15 | | 65 |
| Total number of hours | | 109 |
| Number of ECTS credits | | 4 |