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, dr Grzegorz Ziemniak | | |
|  | 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 students will be introduced to: deformation mechanisms (including intracrystalline deformation, recovery, recrystallisation, grain boundary area reduction and static recrystallisation), foliation, lineation and lattice-preferred orientation (LPO), shear zones, mylonites, shear sense, and microscopic shear sense indicators, and porphyroblasts (including porphyroblast nucleation and growth, inclusions in porphyroblasts, porphyroblast-matrix relationships), crystal size distribution (CSD), modal composition, inclusions in different mineral populations, microstructures associated with specific crystallisation conditions.    Laboratories  During the laboratories students will be introduced to basic software used in modern image analysis. Using the software, students will analyse sequences of images showing the development of recrystallisation microstructures produced during deformation of both synthetic materials and rocks. Students will also learn the basics of interpreting deformation microstructures in the context of shear zone formation and metamorphism (with emphasis on porphyroblasts and their relationship to the rock matrix), and how to interpret crystal size distributions in magmatic rocks to describe the conditions of their crystallization. | | |
|  | Intended learning outcomes  P\_W01 The student can describe and interpret observed microstructures.  P\_W02 The student is familiar with modern techniques of microtectonics and microstructural analysis.  P\_W03 The student can synthesise the data he/she has collected and critically formulate conclusions.  P\_U01 Students will be able to 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 |