SYLLABUS

Mineralogy and Crystallography 7.5 credits O0042K

Mineralogi och kristallografi

Course syllabus admitted: Autumn 2023 Sp 1 - Present

DECISION DATE
2022-06-15

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LULEÅ TEKNISKA UNIVERSITET

Mineralogy and Crystallography 7.5 credits O0042K

Mineralogi och kristallografi

First cycle, O0042K

Education level	Grade scale	Subject	Subject group (SCB)
First cycle	G U 3 4 5	Malmgeologi	Earth Science and Physical Geography

Main field of study

Geosciences

Entry requirements

In order to meet the general entry requirements for first cycle studies you must have successfully completed upper secondary education and documented skills in English language and O0041K Geoscience or equivalent

Selection

The selection is based on 1-165 credits.

Course Aim

Having completed the course, students should be able to apply theoretical knowledge and optic analytical methods for identifying geologically, economically, environmentally and technically important minerals. Students should be able to account for the minerals' chemical and physical properties and their most common way of occurrence.

Students should be able to perform mineral identification in hand specimen and on the microscale, and explain the application of X-ray diffractometric measurements and scanning electron microscopy in studies of minerals.

Students should be familiar with solid state chemistry to the extent that they can explain and apply concepts in crystallography. The students should also be able to explain and use concepts such as unit cell, crystal system, Bravais lattice, Miller index, and be able to use these to describe the order of atoms in different crystal structures. The student should also be able to explain concepts such as solid solutions, substitution and mixed series of minerals.

Contents

During the course, students work with theoretical aspects of crystallography, mineralogy and X-ray diffraction, in combination with practical exercise where this knowledge is used for characterizing crystal structures. Students are given an in-depth review of the optical theory that underlies petrographic microscopy and mineral identification using transmitted and reflected light in a polarization microscope. A review of a selection of geologically, technically, environmentally and economically important minerals and mineral groups (silicates, salts, oxides, sulphides, sulphates, carbonates) is combined with practical exercises, where students apply their knowledge for mineral identification

Realization

Each course occasion´s language and form is stated and appear on the course page on Luleå University of Technology's website.
The subject is presented in the form of class lectures by several lecturers and mandatory exercises in mineral analysis, crystallography, microscopy and mineral identification. The exercises are partly teacher-supervised and partly individual. The exercises will be partly linked to lectures and performed in parallel. Document management takes place in the learning platform CANVAS.

Examination

If there is a decision on special educational support, in accordance with the Guideline Student's rights and obligations at Luleå University of Technology, an adapted or alternative form of examination can be provided. Short written exams are performed after each course module with differentiated grades (grade scale: 5 4 3 U). In order to pass the course, the student must complete and report in writing all practical assignments and pass them.

Unauthorized aids during exams and assessments

If a student, by using unauthorized aids, tries to mislead during an exam or when a study performance is to be assessed, disciplinary measures may be taken. The term “unauthorized aids” refers to aids that the teacher has not previously specified as permissible aids and that may assist in solving the examination task. This means that all aids not specified as permissible are prohibited. The Swedish version has interpretative precedence in the event of a conflict.

Course offered by

Department of Civil, Environmental and Natural Resources Engineering

Modules

Code	Description	Grade scale	Cr	Status	From period	Title
0001	Short written exam, Mineral identification	G U 3 4 5	2	Mandatory	S23	
0002	Short written exam, Opaque microscopy	G U 3 4 5	1.5	Mandatory	S23	
0003	Short written exam, Transmission microscopy	G U 3 4 5	1.5	Mandatory	S23	
0004	Short written exam, Crystallography and X-ray diffraction	G U 3 4 5	1.5	Mandatory	S23	
0005	Excercises	U G#	1	Mandatory	S23	

Study guidance

Study guidance for the course is to be found in our learning platform Canvas before the course starts. Students applying for single subject courses get more information in the Welcome letter. You will find the learning platform via My LTU.

Last revised

by Assistant Director of Undergraduate Studies Eva Gunneriusson, Department of Civil, Environmental and Natural Resources Engineering 2022-06-15

Syllabus established

by Assistant Director of Undergraduate Studies Eva Gunneriusson, Department of Civil, Environmental and Natural Resources Engineering 2022-02-11