GHENT UNIVERSITY

Course Specifications

Valid as from the academic year 2024-2025

Physical–Chemical Properties of Rocks, Minerals and Materials (I002195)

Course size *(nominal values; actual values may depend on programme)*

Credits 5.0 **Study time 150 h**

Course offerings in academic year 2026-2027

A (semester 2) English Gent

Lecturers in academic year 2026-2027

Almqvist, Bjarne UPPSALO1 lecturer-in-charge

Offered in the following programmes in 2026-2027	**crdts**	**offering**
International Master of Science in Sustainable and Innovative Natural Resource Management	5	A

Teaching languages

English

Keywords

Position of the course

Methods such as seismic, electromagnetic and gravity measurements comprise powerful tools for studying large volumes of the inaccessible sub-surface of the Earth. However, the direct observables are often of limited usefulness, such as seismic velocity or electric conductivity. By studying the physical and chemical behaviour of rocks, this course provides the methods required for linking geophysical data to geology.

Contents

This course is divided into physical and chemical properties. Physical properties include an introduction on rocks and minerals, density, porosity, permeability, elastic and inelastic properties, rock quality and seismic properties, magnetic electric and thermal properties of rocks, in-situ and downhole physical property measurements. Chemical properties include mineral and material structures, composition and alloying, thermodynamics of minerals and materials, investigation of chemical properties by analytical methods.

Initial competences

120 credits including 90 credits in science/engineering (physics, chemistry, biology, mathematics, earth science, computer science, material science), including 15 credits in mathematics or physics and 10 credits in chemistry. Proficiency in English equivalent to the Swedish upper secondary course English 6.

Final competences

1 On completion of the course, the student should be able to:
- Describe relationships between different physical and chemical properties.

2 • Compare different types of minerals and rocks and their physical and chemical properties.

3 • Formulate different systems of symmetries and anisotropic systems associated with each system.

4 • Relate scale dependencies between various measurements (lab, field and/or downhole).

5 • Design suitable geophysical and laboratory methods for the exploration and/or processing of a given mineral.

Conditions for credit contract

This course unit cannot be taken via a credit contract

Conditions for exam contract

This course unit cannot be taken via an exam contract

Teaching methods

Seminar, Lecture, Practical, Independent work

Extra information on the teaching methods

Lectures, seminars, solving exercises (homework and computer lab work) and lab and field measurements.

Study material

None

References

Course content-related study coaching

Assessment moments

end-of-term and continuous assessment

Examination methods in case of periodic assessment during the first examination period

Skills test, Written assessment, Assignment

Examination methods in case of periodic assessment during the second examination period

Skills test, Oral assessment, Written assessment, Assignment

Examination methods in case of permanent assessment

Oral assessment, Skills test, Written assessment, Assignment

Possibilities of retake in case of permanent assessment

examination during the second examination period is possible in modified form

Extra information on the examination methods

Written examination (2 credits), homework assignments (1 credit), computer projects (1 credit) and written report (1 credit)

If there are special reasons for doing so, an examiner may make an exception from the method of assessment indicated and allow a student to be assessed by another method. An example of special reasons might be a certificate regarding special pedagogical support from the disability coordinator of the university.

Calculation of the examination mark

Written examination (50 %)
Homework assignments, computer projects and written report (50%)