

SYLLABUS

Geology I 7.5 credits

Q0050B

Geologi I

Course syllabus admitted: Spring 2016 Sp 3 - Spring 2020 Sp 4

DECISION DATE
2015-02-10

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Geologi I

First cycle, Q0050B

Education level	Grade scale	Subject	Subject group (SCB)
First cycle	G U 3 4 5	Berg- och mineralteknik	Mining and Mineral Technology

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 + Swedish upper secondary school courses Mathematics 1a/1b/1c (specifik entry A7).

Or:

Swedish upper secondary school courses Mathematics A (specifik entry 7)

Selection

The selection is based on final school grades or Swedish Scholastic Aptitude Test.

Examiner

Rob Hellingwerf

Course Aim

After successfully concluded course the student will be able to:

- describe the Earth's interior composition, and the relationship between the movement of the plates, volcanism and earth quakes
- apply plate tectonic concepts such as spreading ridges, transverse faults, subduction and anatexis
- describe the mineral crystal systems and explain crystallographic symmetry operations
- apply various methods in order to identify the most important minerals and rock types
- apply structural geological concepts such as brittle and ductile deformational processes, fold structures, and faults
- meet the customers demands on industrial mineral specifications
- participate in construction projects where identification of deformed geological situations with zones of weakness are of the highest priority

Contents

The course provides knowledge on the Earth's interior and general geology, including plate tectonics, subduction and volcanism. as well as on fundamental crystallography, mineralogy and petrology. The physical and chemical properties of rocks and minerals are emphasised, as well as their industrial applications. The teaching approach is general in order to supply the student with knowledge that can be applied to most mining- and constructing enterprises. In connection to mineralogy and petrology the use of a microscope is introduced, in order to highlight the optical properties.

The course comprises the following moments:

- The Earth's interior, plate tectonics, continental drift, subduction, volcanism, active and passive continental margins, extension, compression, mid-oceanic ridges
- Fundamental crystallography: crystal system, symmetry element and -operations, identification of crystal class
- Systematic mineralogy: mineral properties, mineral groups, silicates and non-silicates, identification of minerals
- Fundamental petrology: rock classification, magmatic -, sedimentary -, volcanic and metamorphic rock types, rock-forming minerals, Streckeisen classification
- Ductile and brittle deformation, fold structures, faults, lineation, foliation
- Introduction to optical analysis of minerals and rock types using a microscope.

Realization

Each course occasion's language and form is stated and appear on the course page on Luleå University of Technology's website.

Lectures, laboratory exercises, practicals and excursions. The latter three are mandatory.

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. The examination comprises a theoretical and a practical part. The theoretical part consists of a written exam for 4 credits. The practical part consists of a 2 credit macroscopic practical exam and a 1.5 credit microscopic practical exam. In these practical exams the student describes and identifies mineral and rock properties in carefully selected samples.

Literature. Valid from Spring 2016 Sp 3

1) Compendium Geology (Hellingwerf, Bergsskolan/ School of Mining)
and

2) Loberg, Bengt med ett kapitel om industriella mineraler och bergarter av Naz Ahmed Shaikh. (2003) Geologi : material, processer och Sveriges berggrund. 6 uppl. Stockholm : ePan. (515 s). ISBN 91-7297-635-7

or ONE of these american publications (3, 4, 5 or 6):

3) UNDERSTANDING EARTH av John Grotzinger, Thomas H. Jordan, Frank Press. Språk:Engelska. Utgiven: 2010-03. ISBN: 9781429240031. Förlag: W.H.Freeman Co Ltd. Upplaga: 6 Rev ed. Antal sidor: 680 sidor
or

4) UNDERSTANDING EARTH av John Grotzinger, Thomas H. Jordan, Frank Press. Språk:Engelska. Utgiven: 2010-02. ISBN: 9781429219518. Förlag: W.H. Freeman Company. Upplaga: 0006. Antal sidor: 672 sidor
or

5) UNDERSTANDING EARTH, 5th edition By John Grotzinger, Thomas H. Jordan, Frank Press, Raymond Siever. Språk:Engelska. Utgiven 2006. ISBN: 0716766825. Antal sidor: 672
or

6) UNDERSTANDING EARTH, 4th edition

Publication Date: 18 Aug 2003. ISBN-10: 0716796171. ISBN-13: 978-0716796176 4th Revised edition

Course offered by

Department of Civil, Environmental and Natural Resources Engineering

Items/credits

No items/credits available

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.

Syllabus established

by Eva Gunneriusson 2015-02-10