Faculty of Science

GEOM05, Magmatic Petrology, Geochemistry and Geochronology, 15 credits

Berggrundsgeologi: Magmatisk petrologi, geokemi och geokronologi, 15 högskolepoäng

Second Cycle / Avancerad nivå

Details of approval

The syllabus was approved by Study programmes board, Faculty of Science on 2010-12-01 to be valid from 2010-11-01, autumn semester 2010.

General Information

The course is an elective course for second-cycle studies for a Degree of Master of Science (120 credits) in geology.

Language of instruction: English and Swedish
The course is given in English.

Main field of studies	*Depth of study relative to the degree requirements*
Geology	A1N, Second cycle, has only first-cycle course/s as entry requirements

Learning outcomes

The aim of the course is that students should have acquired the following knowledge and skills on completion of the course; they should

Knowledge and understanding

- be able to account for the equilibrium concept, elemental and isotopic distributions, kinetics and transport mechanisms during endogenic processes,
- at a general level be able to describe the origin of Earth based on extraterrestrial material and the change in heat content of Earth through geological time,
- at a general level be able to account for the Precambrian evolution of the seas and the atmosphere and their relations to biogenic processes,
- be able to explain and understand nucleation processes, crystal growth and textural development during the crystallisation of magmas,

- in detail be able to account for the processes that control the chemical and mineralogical development of magmas,
- be able to account for different geochemical and isotope geological methods, and be able to describe how these methods are used to acquire knowledge of petrological processes,
- independently be able to describe different tectonic environments and their effects on petrological processes in igneous systems,
- at a general level be able to account for the most important radiogenic dating methods and their applications,

Competence and skills

- be able to identify the most common ore minerals by means of light microscopy,
- at a general level be able to describe how an electron microscope functions and how elemental analyses are carried out.

Course content

The course is focused on igneous petrology. The integration of igneous petrology in tectonic environments is essential and is demonstrated in the field. The physico-chemical background to the genesis and crystallisation of magmas is emphasised in the teaching. Strengths and weaknesses in different geochemical diagrams and different principles of rock-type classification are discussed. The principles of radiogenic dating methods and their applications to solve different geological problems are treated. The course also gives a basic orientation of different methods for chemical analysis of minerals and rocks. Exercises in advanced identification of rock types as well as optical and electron optical microscopy constitute important parts of the course.

Course design

The teaching consists of lectures, field exercises, group work and seminars. Participation in field exercises, group work and seminars and thereby integrated other teaching is compulsory.

Assessment

The examination takes place in writing in the form of examination at the end of the course.

For students who have not passed the regular examination, additional examination in close connection to this is offered.

Subcourses that are part of this course can be found in an appendix at the end of this document.

Grades

Marking scale: Fail, Pass, Pass with distinction.
The grades in the course are passed with distinction, passed and failed. To pass the entire course, approved examination and approved written assignments and participation in all compulsory parts are required.

The final grade is determined by summarising the results of all parts that are included in the examination.

Entry requirements

For admission to the course, general entry requirements are required and 75 credits in geology including GEOB01-GEOB04 or the equivalent knowledge, and English B or equivalent.

Further information

The course may not be included in a higher education qualification together with GEOM03 Petrological and ore-forming processes, 15 credits.

Subcourses in GEOM05, Magmatic Petrology, Geochemistry and Geochronology

Applies from H10

1001 Magmatic Petrology, Geochemistry and Geochronology, 15,0 hp
Grading scale: Fail, Pass, Pass with distinction