Faculty of Science

GEON01, Quaternary Geology: Glacial Sedimentology - Processes, Sediments and Landform Systems, 15 credits

Kvartärgeologi: Glacial sedimentologi - processer, sediment och landformssystem, 15 högskolepoäng

Second Cycle / Avancerad nivå

Details of approval

The syllabus was approved by Study programmes board, Faculty of Science on 2007-01-31 to be valid from 2007-02-01, autumn semester 2007.

General Information

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

Language of instruction: Swedish and 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 aims of the course are that students should have acquired the following knowledge and skills on completion of the course; they should

- be able to account for how different processes interact in different glacial environments and be able to describe sedimentary facies models for subglacial, supraglacial, ice marginal, proglacial, glaciolacustrine and glaciomarine environments,
- be able to reconstruct glacial dynamics, glacial depositional environments and deglaciation patterns based on both detailed studies of sediment sequences exposed in sections and on large-scale map-based and aerial photographic interpretations of distributions of landforms and land systems,
- be familiar with scientifically established criteria for identification of different glacigenic sediments and be able to independently choose and apply appropriate

documentation and analytical methods in the field and in the laboratory to identify and describe these criteria,
- independently be able to plan and carry out a sedimentological field study of a larger exposure with complex, glacigenic sediment successions. The study shall be presented as a scientific project report, contain a formulated scientific objective and show the ability to perform critical evaluation and interpretation of field and laboratory results and draw justified conclusions,
- be able to summarise a scientific primary publication in the form of a poster presentation and be able to both argue for and critically assess the view points of the authors.

Course content

The course consists of two parts:

Part 1. Glaciology, glacial sedimentology: processes and sediment products
Glaciology: climatic factors, glacial rheology, energy and mass relations, movement patterns of ice sheets and topographically controlled glaciers, process dynamics of temperate and polar glaciers, glacier hydrology.
Glacial geology: interaction between glaciers and their surroundings, processes of glacial erosion, deformation, transport and deposition, textural and structural properties of tills, glaciotectonics, glaciofluvial, glaciolacustrine and glaciomarine processes and sediment products.
Field course 1: field studies in the fore field of a contemporary glacier, including glacier dynamics, active glacial and glaciofluvial processes of erosion, deformation and deposition. The process studies will be used for interpretation of sediments and land forms close to the present glacier.
Field course 2: field investigations of a larger section showing different types of tills, glacial tectonic structures, coarse glaciofluvial sediments and glaciolacustrine sequences. Documentation methods, sampling techniques, laboratory preparation and analyses, compilation and assessment of data, interpretation of data and preparation of project report..

Part 2. Glacigenic land forms and land systems Glacigenic land forms and land systems: glacial land forms as products of glacial erosion, deformation and deposition, glaciofluvial, glaciolacustrine and glaciomarine land forms, geomorphological mapping based on air photo interpretation, reconstruction of glacial dynamics and glacial depositional environments based on distributions and patterns of land form systems.

Excursion: the glacial history of a region as demonstrated through the occurrence and distribution pattern of glacigenic sediments and land forms.

Course design

The teaching consists of lectures, practicals, field exercises and excursions, seminars and project work. Practicals, field exercises and excursions, seminars and project work are compulsory.

Assessment

The examination takes place in writing in the form of examination at the end of the course and through assessment of individual project reports. 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 passed project reports 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 together with 90 credits in geology including GEOB01-GEOB05 or the equivalent knowledge, or 90 credits in earth sciences or physical geography, and English B or the equivalent.

Further information

The course may not be included in a higher education qualification together with KVG529 Quaternary geology: glacial sedimentology, processes, sediment products and land forms, 15 credits, or KVG525 Quaternary geology: glacial sedimentology, processes, sediment products and land forms, 15 credits.

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Subcourses in GEON01, Quaternary Geology: Glacial Sedimentology - Processes, Sediments and Landform Systems

Applies from H07

0701 Glacial Sedimentology, 15,0 hp
Grading scale: Fail, Pass, Pass with distinction