Faculty of Science

GEOM22, Geology: Quaternary Geology and Landscape Dynamics, 15 credits

Geologi: Kvartärgeologi och landskapsdynamik, 15 högskolepoäng

Second Cycle / Avancerad nivå

Details of approval

The syllabus was approved by The Education Board of Faculty of Science on 2025-05-30. The syllabus comes into effect 2025-05-30 and is valid from the spring semester 2026.

General information

The course is an elective second cycle component of a Master of Science degree in Geology.

Language of instruction: English

Main field of study	*Specialisation*
Geology	A1N, Second cycle, has only first-cycle course/s as entry requirements

Learning outcomes

The aim of the course is to give students in-depth knowledge of Quaternary geology and analysis of landscape development in and adjacent to previously glaciated areas. The course deals with climate and environmental changes over the last 2.6 million years, and focuses on the analysis and process understanding of glacial landscapes and different sedimentation environments.

Knowledge and understanding

On completion of the course, the student shall be able to:

- account for the fundamental features of the global climatic and environmental development and the glaciation history during the Quaternary Period, as well as their major causal relations
- explain the emergence of the ice age theory

- describe different processes in glacial and ice-free environments, and describe the deposits and landforms formed by these processes

Competence and skills

On completion of the course, the student shall be able to:

- classify organogenic and minerogenic soils and relate these to the depositional process and formation environment
- set up a scientifically based conceptual model of the Quaternary stratigraphy and geomorphology of an area, and describe in detail its evolutionary history, based on existing source material and own investigations
- independently perform Quaternary geological analyses through field work, laboratory work and/or modelling, and process and draw reasonable conclusions from data from these analyses
- present their own analyses and interpretations in writing and orally at a scientific level
- summarise primary scientific publications in the field of Quaternary geology and landscape analysis

Judgement and approach

On completion of the course, the student shall be able to:

- critically analyse and evaluate environmental and climate reconstructions relevant to the subject area

Course content

This course provides the tools and knowledge needed to analyse soil layers in scientific and professional contexts and understand their three-dimensional structure, as well as the processes that have created and reshaped them. The student will work on complex issues of how landscape evolution and soil properties in and around previously glaciated areas are linked to the water cycle, climate change, erosion problems and pollution spreading. The course consists of two parts running partly in parallel. Within the framework of a theoretical part, students gain advanced knowledge of soil processes, formations, and analytical methodologies, while the project work provides practical training in applying knowledge and skills.

The main objective of the course is to provide training in analysing landscapes and soil layers based on own observations in the form of field studies and data analyses. This is based on extensive project-based field training. The project is carried out in a geographical area where many different aspects of the landscape and its evolution during the Quaternary are observed and analysed. This includes the use of maps, studies of landforms, stratigraphy and sedimentary structures, sediment sampling and laboratory analyses. The project approach is designed to provide relevant experience for both research and labour market applications.

Course design

Teaching consists of lectures, seminars, exercises, assignments, fieldwork and project work. Participation in seminars, exercises, group work, field work and project work and related elements is compulsory.

Assessment

Examination of the theoretical part takes place continuously during the course through an examination portfolio consisting of quizzes (4 credits) and seminar participation (3.5 credits). The practical part (7.5 credits) is examined through a final project work that includes a written report and seminar.

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

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

Grades

Grading scale includes the grades: Fail, Pass, Pass with distinction
To pass the entire course, you must pass quizzes and seminars (examination portfolio), and pass the project work.

The grading scale for quizzes and written report of the project work is Fail, Pass and Pass with distinction, while the grading scale for seminars is Fail and Pass.

The final grade is determined by weighing the grades of the quizzes and written report of the project work.

Entry requirements

Admission to the course requires 90 credits in geology. English 6/English B.

Further information

The course is given at the Department of Earth and Environmental Sciences (MGeo), Faculty of Science, Lund University.