



Department of Earth and Environmental Sciences

GEON06, Quaternary Geology: Palaeoecological Methods and Environmental Analysis, 15 credits

Kvartärgeologi: Paleoekologisk metodik och miljöanalys, 15 högskolepoäng
Second Cycle / Avancerad nivå

Details of approval

The syllabus was approved by Study programmes board, Faculty of Science on 2016-04-04. The syllabus comes into effect 2016-07-01 and is valid from the autumn semester 2016.

General information

The course is an elective second cycle course for a degree of Master of Science (120 credits) 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 general aim of the course is to provide students with theoretical and practical knowledge and skills to execute and interpret palaeoecological investigations. Together with knowledge obtained in other second cycle courses in Quaternary geology, this knowledge is to be used for specialised understanding and execution of environment and climate reconstructions on different time scales, focussed mainly on the last ice age cycles.

Knowledge and understanding

On completion of the course, the students shall be able to

- describe and explain in detail the methodology for vegetation and landscape reconstruction using pollen and macrofossil analyses

- account for the principles of different dating methods, mainly dendrochronology, chronology based on laminated sediments and palaeomagnetism, and interpret the results of such studies
- describe the use, limitations and sources of error of radiocarbon dating and, to some extent, other radiometric dating methods, and interpret the results of studies based on these methods
- account in detail for the composition, formation and typical environments of organogenic deposits, and describe their occurrence regionally and in various stratigraphic settings

Competence and skills

On completion of the course, the students shall be able to

- independently execute pollen analyses, macrofossil analyses and mineral magnetic measurements, and process and draw conclusions from these analyses
- present their own analysis results and interpretations in the form of written reports and poster presentations

Judgement and approach

On completion of the course, the students shall be able to

- critically review and evaluate results and interpretations based on palaeoecological investigations
- apply a historical-geological perspective to vegetation and environmental changes and critically evaluate changes in the environment and vegetation on different time scales

Course content

The theoretical and practical components of the course content are linked to a project that is to be pursued throughout the course. The theoretical and practical knowledge is to be applied in the project and the results presented in an individual written report and a joint poster presentation.

The course consists of the following practical and theoretical components:

- Field work including core collection and subsampling of working material for the analyses that are to be executed during the course
- Pollen analysis, processing and computer-assisted diagram construction, and interpretation of the analysis results
- Macrofossil analysis and processing and interpretation of analysis results
- Mineral magnetic analyses, use and sources of errors
- Laminated sediments and their use in chronological investigations
- Radiocarbon dating and other radiometric dating methods, their applications, limitations and sources of error. Calibration of radiocarbon ages to calendar ages
- Dendrochronology, methodology and interpretation of results

- The formation of organogenic deposits and analysis of collected material
- Late Quaternary chronostratigraphy, vegetation history and cultural landscape development
- Presentation of results, report writing and poster design

Course design

The teaching consists of lectures, laboratory exercises, field exercises, seminars, group exercises and project work. Participation in laboratory exercises, field exercises, seminars, group exercises and project work and any integrated teaching is compulsory.

Assessment

The assessment is based on a written exam, an individual written report and a joint poster presentation during the course.

Students who failed the first exam opportunity will be offered an additional exam opportunity shortly thereafter.

Grades

Grading scale includes the grades: Fail, Pass, Pass with distinction

For a grade of Pass on the whole course, students must have passed the exam, the project report and participated in all compulsory components. The final grade is determined by a weighting of the included assessed components relative to their scope.

Entry requirements

To be admitted to the course, students must have 90 credits in geology including knowledge equivalent to courses GEOB21-GEOB25 or GEOB01-GEOB04, or 90 credits in physical geography, biological subjects or archaeology. Proficiency in English corresponding to English B/English 6 from Swedish upper secondary school.

Further information

The course may not be included in degree together with GEON02 Quaternary Geology: Palaeoecological Methodology and Environmental Analysis, 15 credits, KVG530 Quaternary Geology, Palaeoecological and Chronological Methodology, 10 credits, or KVG526 Quaternary Geology, Palaeoecological and Chronological Methodology, 10 credits.