Faculty of Science

GEON07, Quaternary Geology: Quarternary Climate and Glaciation History, 15 credits

Kvartärgeologi: Kvartär klimat- och glaciationshistoria, 15 högskolepoäng

Second Cycle / Avancerad nivå

Details of approval

The syllabus is an old version, approved by Study programmes board, Faculty of Science on 2016-09-17 and was valid from 2017-01-01 , spring semester 2017.

General Information

The course is an elective second cycle course for a degree of Master of Science (120 credits) in Geology.

Main field of studies	*Depth of study relative to the degree requirements*
Geology	A1F, Second cycle, has second-cycle course/s as entry requirements

Learning outcomes

The general aims of the course are advanced knowledge of the Earth's climate and glaciation history during the Quaternary Period, with special focus on the development in northern Europe and Scandinavia during the last ice age cycle, but also with an outlook to other parts of the world. In order to reach this knowledge, students need a basic understanding of palaeoecological, palaeoclimatic and glacial geological research methodology as well as an ability to interpret complex relationships based on Quaternary proxy records and modelling results. Together with knowledge obtained in other Master courses in Quaternary geology, this knowledge will form the basis for advanced understanding and execution of environment and climate reconstructions on different time scales, with a primary focus on the most recent ice age cycles.

Knowledge and understanding
On completion of the course, the students 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
- account thoroughly for the Late Quaternary stratigraphy,and the environmental, climatic and deglacial development of northern Europe, and account generally for the corresponding development in other parts of the world

Competence and skills
On completion of the course, the students shall be able to

- independent and in a reflecting way analyse and interpret various types of data from terrestrial and marine deposits as well as iskärnor, and based on such interpretations and comparisons reconstruct climate and environmental changes during the quaternary period
- profit, assess and discuss scientific primärpublikationer in the subject critically as well as based on such material summarise a given current research issue
- communicate orally and in writing in English as well as in a well balanced way utilise the scientific language for special purposes in the subject

Judgement and approach
On completion of the course, the students shall be able to

- evaluate ongoing global and regional climate changes as well as future climate scenarios in the perspective of quaternary climate variations
- evaluate sentida human influence on the klimatsystem of the soil in relation to natural climate variations on different time scales

Course content

The course consists of two parts:

Part 1. Literature, seminars and excursions, 10 credits Literature, seminars and field trips, 10 credits
The following topics are treated based on lectures, literature studies (text book and primary scientific publications), seminars with oral presentations and excursions:

- Paleoklimatologisk forskningshistorik and the emergence of istidsteorins
- The causes behind quaternary climate variations
- Reconstruction of climate changes based on analysis of natural klimatarkiv (terrestrial and marine deposits as well as iskärnor)
- The introduction, early ice ages and mellanistider of the quaternary period
- Climate and environmental changes during the latest istidscykeln
- The latest Scandinavian the glacial dynamics as well as stadialer of inlandsisens and interstadialer during the early and most central parts of the latest ice age
- The latest Scandinavian the avsmältning of inlandsisens and the following development of Östersjöbassängen
- Climate and environmental changes during the final phase of the latest glaciationen and during the current mellanistiden as well as the causes behind short climate variations
- The senkvartära glaciations of Polarområdenas and climate history
- North America's glaciationshistoria with an emphasis on the latest the avsmältning of inlandsisens
- General overview of climate and glaciationsdynamiken the rest of the world during the latest istidscykeln
- Human development in relation to quaternary climate and miljöutveckling
- Ongoing climate development, human influence on klimatsystemet and future climate scenarios
- Quaternary stratigraphy, development history and glacial landscapes in the latest Scandinavian the randområde of inlandsisens, Skåne-Danmark (field trip)
- Quaternary stratigraphy and development history in southern and most central Sweden (field trip)

Part 2. Written assignment and oral presentation, 5 credits Thesis and oral presentation, 5 credits

The student chooses a topic with relevance to the course content in consultation with the teachers. The research question should be treated in writing based on critical assessment of a number of primary scientific publications. The essay is also presented in the form of an oral presentation.

Course design

The teaching consists of lectures, seminars, field teaching and project work with written and oral presentation. Participation in seminars, field teaching, project work and presentations as well as associated component are compulsory.

Assessment

Examination takes place in writing in the form of a take-home examination during the course, through assessing submitted project report and oral presentation as well as through compulsory components. Students who failed the first exam opportunity will be offered an additional exam opportunity shortly thereafter.

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 decided through a joining of the results of project report and examination in proportion to their extent (see appendix).

Entry requirements

For admission to the course, general entry requirements are required as well as 90 credits geology including GEOB22-GEOB25 or GEOB01-GEOB04 as well as GEON05 Kvartärgelogi: Glacial sedimentology- processes, sediments and landformssystem, 15 credits, and GEON06 Quaternary geology: Paleoekologisk methodology and environmental analysis, 15 credits or the equivalent knowledge. 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 GEON03 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. Quaternary climate and glaciationshistoria, 15 credits, KVG531 Quaternary geology,
quaternary climate and glaciationshistoria, 10 credits, or KVG528 Quaternary geology glaciationshistoria, vegetationsutveckling, regional stratigraphy and global climate changes, 10 credits.

Subcourses in GEON07, Quaternary Geology: Quarternary Climate and Glaciation History

Applies from V17

1601 Written Home-Based Examination, 10,0 hp
Grading scale: Fail, Pass, Pass with distinction
1602 Project Report, 5,0 hp
Grading scale: Fail, Pass, Pass with distinction
1603 Mandatory Learning Activities, 0,0 hp
Grading scale: Fail, Pass