



DEPARTMENT OF EARTH SCIENCES

GVK440 Quaternary Development and Paleoclimate, 7.5 credits

Kvartärutveckling och paleoklimat, 7,5 högskolepoäng

Second Cycle

Confirmation

This course syllabus was confirmed by Department of Earth Sciences on 2012-09-27 and was last revised on 2019-02-15 to be valid from 2019-02-15, autumn semester of 2019.

Field of education: Science 100%

Department: Department of Earth Sciences

Position in the educational system

The course is included in the Earth Science Master's Program (N2GVS), but can also be taken as an elective course.

The course can be part of the following programme: 1) Master's Programme in Earth Sciences (N2GVS)

Main field of studies

Earth Sciences

Specialization

A1N, Second cycle, has only first-cycle course/s as entry requirements

Entry requirements

For admission to the course, 120 credits are required completed courses in the main subject Earth sciences of which at least 75% with the grade Pass. Students with equivalent education can after assessment be given admission to the course.

Learning outcomes

Upon successful completion of the course, the student will be able to:

Knowledge and understanding

- Evaluate climate and paleoclimate data from various databases, make appropriate interpretations and comparisons among various databases
- Describe and explain climate cycles during the Quaternary and earlier periods (Milankovitch cycles, Heinrich events, Dansgaard-Oeschger cycles, ENSO variations)
- Describe and explain the geologic history of the Quaternary on land and sea, locally, regionally and globally
- Describe and explain the leading theories about climate change and how landscape development has changed through time.

Competence and skills

- Show advanced knowledge of and ability to explain different paleo-proxies and their advantages, compare them and place them in a large-scale context
- Judge the potential and limitation of paleo-proxies and data sources.
- Analyse information from primary research articles and scientific reports.

Judgement and approach

- Critically evaluate and assess the quality of the science and conclusions in primary research articles and scientific reports.
- Critically evaluate and assess the quality of data and conclusions that have been received and that are presented in group assignments.
- Justify the most important results in a summarising report.

Course content

The aim of the course is to provide interdisciplinary knowledge of the development of climate during geologic history to give additional knowledge in Quaternary geology for students with other geoscience fields. The course is given full-time and is divided into 2 modules. The teaching consists of lectures, compulsory group assignment, and compulsory seminars.

Module 1: Theory (4 hp). This part of the course deepen the knowledge of the earlier climate changes and variability on different time scales and the mechanisms behind these. The main focus will be to review different climate indicators critically that are used to interpret climate

beyond observations. We will focus on important periods of historical climate eras such as the Bølling warm period, the Younger Dryas, 8.2 ka event, and the transition from medieval climate to the small ice age (MCA/work-integrated learning). Social changes during Holocene (with a focus on the final 2K) come to be discussed briefly. Individual

poster presentations about a proxy will be evaluated.

Module 2: Group assignment (3.5 hp). The students will work in groups on paleoclimate data, collected from different sources, that will be analysed and be synthesised for different time frames with a focus on the eastern North Atlantic region. The results will be presented orally at a seminar and in the form of a written report.

Form of teaching

The course contains lectures, exercises, computer exercises, reports, and presentations.

Language of instruction: English

All master's level courses are given in English.

Assessment

Theory 4 credits. Active participation in seminars, individual presentation

Fail/Pass/Pass with distinction (U/G/VG)

Exercises 3.5 credits. Written reports and individual presentation Fail/Pass (U/G)

Grades

The grading scale comprises: Pass with Distinction (VG), Pass (G) and Fail (U).

For a passing grade (G) for the entire course, a passing grade is required for all graded sections. To receive the grade passed with distinction (VG) for the final grade, the grade passed with distinction for the Theory section (examination) as well as at least passed for all other sections is required.

A student that has failed the same examination twice is entitled to have another examiner appointed, if it is possible. The application shall be in writing and sent to the department.

In cases in which the course has been discontinued or major changes have been made a student should be guaranteed at least three examinations to complete the course (including the regularly scheduled examination) during a time period of at least one year from the last given course.

Course evaluation

The result and any changes in the course structure will be communicated to both the students who completed the evaluation and to the students who will begin the course.

Additional information

Students in the master's program N2GVS have priority to the course.