UNIVERSITY OF GOTHENBURG

DEPARTMENT OF EARTH SCIENCES

GVN360 Climate change history, 7.5 credits

Klimatförändringshistoria, 7,5 högskolepoäng

First Cycle

Confirmation

This course syllabus was confirmed by Department of Earth Sciences on 2011-09-26 and was last revised on 2019-09-06 to be valid from 2020-01-20, spring semester of 2020.

Field of education: Science 100%
Department: Department of Earth Sciences

Position in the educational system

The course is part of the Bachelor programme in Earth Sciences specializing in Climatology / Physical Geography. The course is also given as a freestanding course.

The course can be part of the following programmes: 1) Bachelor's Programme in Earth Sciences (N1GVS), 2) Bachelor of Science in Environmental Science (N1MVN), 3) Environmental Sciences (N2MVN) and 4) Atmospheric Science, Master's Programme (N2ATM)

Main field of studies	*Specialization*
Earth Sciences	G2F, First cycle, has at least 60 credits in first-cycle course/s as entry requirements

Entry requirements

Qualifications corresponding to 120 credits in Earth Sciences, Geography or Environmental Sciences, of which 75% of the course must at least have the grade Pass and Ma D or the equivalent. Knowledge of Earth system sciences corresponding to GV1410 Earth System Sciences, 30 credits, or GE0400 Geography Introductory level, 30 credits, or NGN160 Atmospheric science, 7,5 credits, all with the grade at least Pass.

Learning outcomes

On successful completion of the course the student will be able to:

Knowledge and understanding

- Explain the mechanisms behind regional climate change and variability during the Holocene, with emphasis on the least 2000 years.
- Describe paleoclimate proxies, their strenghts and limitations.
- Describe past societal changes related to climate.
- Distinguish between pre-industrial and present climates.

Competence and skills

- Plan and conduct a study of past climate-society interactions in a given region, using available resources.
- Show ability of using oral and written communications to describe and discuss results and conclusions.

Judgement and approach

- To critically analyse and evaluate available historical records of past climate and societal change.
- To set the current climate in a long term perspective and assess regional differences in climate through time and space.

The course is sustainability-focused, which means that at least one of the learning outcomes clearly shows that the course content meets at least one of the University of Gothenburg's confirmed sustainability criteria. The content also constitutes the course's main focus.

Course content

The course, which requires full time studies, consists of two parts.

Sub-courses

1. **Part 1: Theory** *(Del 1: Teori),* 3.5 credits
   Grading scale: Pass with Distinction (VG), Pass (G) and Fail (U)
   This part of the course aims at deepening the knowledge of past climate change and variability on different time/space scales, and the mechanisms behind these. We will critically examine the various archives (climate proxies) used to interpret climate beyond the observational records. We will focus on climate variability of the last 2000 years, and how these have affected societies. This include the important aspect of what climate is estimated. We will have in-depth discussions of short-term climate and weather events (extremes) as well as longer period of

climate change, such as the Medieval Climate Anomaly and the Little Ice age. This will allow us to understand how humans and societies have responded to, and coped with, climate change in the past.

2. **Part 2: Group project** *(Del 2: Grupparbete),* 4 credits
   Grading scale: Pass (G) and Fail (U)
   Working in groups, the aim of this project is to estimate the timing of distinct human influence on climate, i.e.the transition from pre-industrial to anthropogenic climate, for different regions using various high-resolution proxy data. The results will be orally presented at a seminar in form of a short written report.

Form of teaching

The course includes lectures, obligatory exercises and seminars, and a group project, which will be reported orally and in writing.

Language of instruction: English

Assessment

To pass, both sub-courses as well as all mandatory components must be completed.

1. Theory (3,5 credits): Written exam and short presentation of paper (U/G/VG).

2. Group project (4 credits): Written report, oral and poster presentation (U/G/VG).

Mandatory seminars and one exercise are included in the course.

If a student who has failed the same examined element on two occassions, whises to change examiner before the next examination session, such a request is to be submitted to the department in writing and granted unless there are special reasons to the contrary (Chapter 6, Section 22 of Higher Education Ordinance).

In the event that a course has ceased or undergone major changes, students are to be guaranteed at least three examination sessions (including the ordinary examination session) over a period of at least one year, though at most two years after the course has ceased/been changed. The same applies to work experience and VFU, although this is restricted to just one additional examination session.

Grades

The grading scale comprises: Pass with Distinction (VG), Pass (G) and Fail (U).
To pass the whole course Godkänd (G) is required for both sub-courses, including at least 60% on the written exam and all the mandatory seminars and exercises have been

attended. For the grade Väl godkänd (VG), VG is required on both sub-courses, including at least 80% on the written exam.

Course evaluation

Course evaluation consists of two components. The first is via dialogue between the course organizer and the participants, for which time will be dedicated during the course. The second evaluation component is carried out at the end of the course using an anonymous questionnaire available on Canvas.

The results of and possible changes to the course will be shared with students who participated in the evaluation and students who are starting the course.