



## Course syllabus

Faculty Board of Science and Engineering  
School of Natural Sciences

1MX002 Klimatfrågan, 7,5 högskolepoäng  
The Climate-Change Issues, 7.5 credits

**Main field of study**

Environmental Science

**Subject Group**

Environmental Science

**Level of classification**

First Level

**Progression**

G1F

**Date of Ratification**

Approved by Organisational Committee 2009-05-12

The course syllabus is valid from spring semester 2010

**Prerequisites**

Physics, Chemistry and Mathematics equating or corresponding to  $\mu$ Fysik A $\mu$ ,  $\mu$ Kemi A $\mu$  and  $\mu$ Matematik C $\mu$  in the Swedish senior high-school system; alternatively  $\mu$ Matematik C $\mu$  and  $\mu$ Naturkunskap B $\mu$ . In addition, the course requires knowledge corresponding to those provided by preceding courses in the Environmental Analyst Programme.

**Expected learning outcomes**

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

- schematically describe the over-arching physical, biogeochemical, and technological contexts that characterize the climate-change issues in accordance with their description by the course contents given below;
- give an overview account of theories, methods and tools used in climate-change studies;
- give examples of natural processes and societal activities that influence the climate, and understand underpinning causal chains;
- give an account of the fundamental processes and mechanisms that influence the radiation balance globally, regionally, and locally;
- give an overview account of the way the climate-change issues interact with other environmental problems and with issues pertaining to the management of natural resources;
- apply simplified methodology for calculating and modeling fundamental processes that govern climate;
- understand the methods used for comparing differing greenhouse gases and other substances in relation to their climatic effects;

- describe the ecological and societal risk pattern implied by climate change;
- exemplify and expound societal opportunities for limiting and attending to these risks;
- give an account of, and draw conclusions from, nationally and internationally ongoing negotiations that address the climate-change issues;
- search for, and compile in an overview manner, information on the climate-change issues, nationally and internationally;
- assess such information;
- apply the knowledge on selected case studies;
- communicate the results of case-study applications.

## Content

- Overview introduction and topical examples.
- Physical foundations of energy transports to and from the Earth's surface.
- The structure and composition of the atmosphere.
- Albedo, aerosols, cloud formation, greenhouse gases, stratospheric ozone depleters, oceanic energy turnover, the role of vegetation, land use.
- Biogeochemical cycles from the climate-science perspective.
- Ecological-theory concepts in climate science.
- The linkages between climatic changes, stratospheric ozone depletion, and changes in tropospheric chemistry.
- Methods in climate studies; computer-based simulation exercises.
- The impacts of societal activities on climate.
- Long-term perspectives; risk perceptions.
- Climate-change issues from the perspectives of actors and environmental negotiations; linkages to energy and transportation systems.
- To the extent that course resources so permit: study tours to institutions and establishments with climate-relevant activities. vv??

## Type of Instruction

The course is given on 50% study-time basis and as web-based teaching.

At least three campus-based course meetings will be carried out in Kalmar.

Teaching includes lectures, group seminars/exercises and (resources permitting) excursions.

Participation in seminars/exercises and excursions is mandatory.

Course participants need access to internet and the web-based platform Moodle.

## Examination

The course is assessed with the grades Fail (U), Pass (G) or Pass with Distinction (VG).

Examination is normally performed through exams in writing at the end of the course; complementary forms of examination may also be applied such as performance evaluations of course participants' work in seminars, special exercises and project assignments.

Criteria for Pass are evident from Intended Learning Outcomes; se above.

An opportunity for renewed examination is offered during study-term time within six weeks; maximum five examination opportunities are offered.

## Course Evaluation

Upon completion, the course participants will evaluate the course by filling out an assessment form. The result of the individual evaluations will be compiled as a summary report to be kept in the department's administrative archives. The outcome of the previous year's evaluation, and possible measures taken, will be discussed with the official responsible for the programme, and with the incoming students at the start of the next course.

## Required Reading and Additional Study Material

### Mandatory literature

Bernes, Claes. 2007. En ännu varmare värld. Naturvårdsverket (ISBN 9789162012618). ~200-250 kr hos bokhandlarna.

IPCC (2008) The 4th assessment of the IPCC: the synthesis report (valda delar)  
[www.ipcc.ch/publications\\_and\\_data/publications\\_ipcc\\_fourth\\_assessment\\_report\\_synthesis\\_repo](http://www.ipcc.ch/publications_and_data/publications_ipcc_fourth_assessment_report_synthesis_repo)

Stern review of the economics of climate change (2007) (valda delar)  
[www.hm-treasury.gov.uk/sternreview\\_index.htm](http://www.hm-treasury.gov.uk/sternreview_index.htm)

Klimat- och sårbarhetsutredningen (2007). Sverige inför klimatförändringarna - hot och  
möjligheter (valda delar)  
[www.regeringen.se/sb/d/108/a/89334](http://www.regeringen.se/sb/d/108/a/89334)