



DEPARTMENT OF EARTH SCIENCES

GVN465 Climate modelling, 15 credits

Klimatmodellering, 15 högskolepoäng

Second Cycle

Confirmation

This course syllabus was confirmed by Department of Earth Sciences on 2018-04-17 to be valid from 2018-09-01, autumn semester of 2018.

Field of education: Science 100%

Department: Department of Earth Sciences

Position in the educational system

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, 180 credits are required in the various main areas of Science. Basic knowledge of climate and climate systems corresponding to GV1410 Geosciences, Basic Level Course 30 credits, GV0340 Earth System Sciences 7.5 credits, and GVN330 Climate data analyses 7.5 credits is required. Students with equivalent education may, after examination, be admitted to the course. The course GVN460 Climate Change in an Earth System Perspective 7.5 credits is recommended.

Learning outcomes

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

Knowledge and understanding

- understand and describe physical and dynamic processes that affect / control the climate system
- understand and describe basic numerical methods used to simulate the climate system
- understand and describe current climate change scenarios
- demonstrate basic knowledge of data analysis tools and Unix / Linux

Competence and skills

- make numerical experiments with simplified climate models (one-dimensional global energy balance climate model)
- compile and run a global climate model
- make experiments with a climate model to test a hypothesis
- analyze and visualize data from climate models

Judgement and approach

- critically appreciate the uncertainty in the climate model simulation

The course is sustainability-related, 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.

Course content

The course deals with physical and dynamic processes that affect / control the climate system and mathematical and computational methods for climate modelling. Students will learn basic physical processes in the climate system and programming in data analysis tools, current scientific understanding of global warming as well as important natural climate variations like El Niño. The course will provide knowledge and understanding of how climate models are designed and used. Students will be able to use climate models as well as analyze and visualize results from climate modelling experiments after the course.

Form of teaching

The course consists of lectures, compulsory modeling exercises, and a compulsory group project work, with a final written exam used to evaluate the students understanding of the lectures and course literature.

Language of instruction: English

Assessment

- Climate modelling, theory, 5 credits, Grading: U/G/VG
- Climate modelling, exercises, 6 credits, Grading: U/G
- Climate modelling, project work, 4 credits, Grading: U/G/VG

Assessment of climate modelling, theory, is based on the written exam.

Assessment of climate modelling, exercises, is based on participation in computer exercises and written reports.

Assessment of climate modelling, project work, is based on active participation, quality and content of the report, and completed oral presentation.

If a student, who has failed the same examined component twice, wishes to change examiner before the next examination, a written application shall be sent to the department responsible for the course and shall be granted unless there are special reasons to the contrary (Chapter 6, Section 22 of Higher Education Ordinance).

In cases where a course has been discontinued or has undergone major changes, the student shall normally be guaranteed at least three examination occasions (including the ordinary examination) during a period of at least one year from the last time the course was given. (Chapter 6, Section 21 of Higher Education Ordinance).

Grades

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

The grade scale includes: Fail (U), Pass (G), Pass with distinction (VG).

In order to get full credits, all modules, including compulsory modules, must be passed.

In order to achieve the grade Pass with Distinction (VG) on the full course, this grade must be achieved in the course part Climate modelling, theory and Climate modelling, project work.

Course evaluation

The course evaluation is performed both as a scheduled dialogue between teacher and students, as well as a written anonymous online survey.

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.

