Department of Earth and Enironmental Sciences

NGEN14, Physical Geography: Greenhouse Gases and Biogeochemical Cycles, 15 credits

Naturgeografi: Växthusgaser och biogeokemiska kretslopp, 15 högskolepoäng

Second Cycle / Avancerad nivå

Details of approval

The syllabus was approved by Study programmes board, Faculty of Science on 2017-03-19. The syllabus comes into effect 2017-03-19 and is valid from the autumn semester 2017.

General information

The course is an elective course for a Master' degree (120 credits) in physical geography and ecosystem science or a Master' degree (120 credits) in atmosphere science and biogeochemical cycles.

Language of instruction: English

Main field of study	*Specialisation*
Atmospheric Sciences and Biogeochemical Cycles	A1N, Second cycle, has only first-cycle course/s as entry requirements
Physical Geography and Ecosystem Science	A1N, Second cycle, has only first-cycle course/s as entry requirements

Learning outcomes

The aim of the course is to provide advanced knowledge in ecosystem science with special focus on the biogeochemical cycle of greenhouse gases and the processes that control these. Furthermore, the course gives a deeper understanding of the feedback mechanisms between the biogeochemical cycles of greenhouse gases and the climate. The course should provide detailed theoretical knowledge of production of greenhouse gases as well as knowledge of modelling methods and measuring techniques in both theory and practice.

Knowledge and understanding

On completion of the course, the students shall be able to:

- explain the abiotic factors and biotic processes that control the biogeochemical cycles of the greenhouse gases
- explain the feedback mechanisms between the biogeochemical cycles of greenhouse gases, vegetation dynamics and climate
- explain the methodology behind the computer-, field-, and laboratory-based methods that are used within the field

Competence and skills

On completion of the course, the students shall be able to:

- independently choose, use and critically review relevant methods within the field
- design, plan and carry out research and investigations in the subject area
- assess, reflect on and critically review literature in the subject area
- collect, compile and analyse measurement data as well as discuss and present results and conclusions in an advanced, structured and logical way as well as in a scientific context

Judgement and approach

On completion of the course, the students shall be able to:

- assess environmental problems related to greenhouse gases
- apply a critical approach to the methods that are used in the subject area as well as to the interpretation and analysis of results
- reflect on the difficulties to estimate sub-processes in the biogeochemical cycles of greenhouse gases

Course content

Course contain lectures that aims to give a solid theoretical knowledge about the carbon cycle, greenhouse gases and environmental problems in the subject area. The course covers processes such as assimilation of carbon in ecosystems via the photosynthesis, discharges of carbon from the ecosystem via respiration and decomposition and production of greenhouse gases (e.g., carbon dioxide, methane, nitrous oxide and other volatile organic carbon compounds). We treat also how these processes are influenced by vegetation and climate change.

The course contains several practical components such as field-, computer- and laboratory-based exercises as well as a longer fieldwork component. These above-mentioned parts intend to give theoretical and practical knowledge of the methods that are used in the subject area.

Course design

The teaching consists of lectures and practical components consisting of exercises, group assignments and a longer project work that includes a field study. All practical components are compulsory.

Assessment

The examination consists of a written exam and grading of oral and written reports on exercises and project work during the course. For students who have failed the regular examination, an additional occasion in close connection to this is offered.

An examiner may decide, after consultation with the Section for Educational Support, to give a student with an abiding physical disability an alternative, equivalent examination.

Grades

Grading scale includes the grades: Fail, Pass, Pass with distinction
To pass the entire course, passed exercises, group assignments and project presentations are required and participation in all compulsory parts. The final grade is decided by compiling the results of the components that are included in the examination in proportion to their extent.

Entry requirements

For admission to the course, general entry requirements are required and 90 credits science studies.

Further information

The course may not be included in a degree together with NGEN04 Greenhouse gases and the carbon cycle, 15 credits.